



NAVAL  
POSTGRADUATE  
SCHOOL

MONTEREY, CALIFORNIA

---

**MBA PROFESSIONAL REPORT**

---

**A Decision Model for Merging Base Operations: Outsourcing Pest  
Management on Joint Base Anacostia-Bolling**

---

By: **Michael C. Bishop**  
**Shane H. Derby**  
**December 2011**

Advisors: **Bryan Lundgren**  
**Dina Shatnawi**

*Approved for public release; distribution is unlimited*

THIS PAGE INTENTIONALLY LEFT BLANK

|  |   |   |   |
|--|---|---|---|
| <b>REPORT DOCUMENTATION PAGE</b>   |   |   | <i>Form Approved OMB No. 0704-0188</i>  |
| Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.  |   |   |   |
| <b>1. AGENCY USE ONLY<br/>(Leave blank)</b>  | <b>2. REPORT DATE</b><br>December 2011                          | <b>3. REPORT TYPE AND DATES COVERED</b><br>MBA Professional Report  |   |
| <b>4. TITLE AND SUBTITLE</b> A Decision Model for Merging Base Operations: Outsourcing Pest Management on Joint Base Anacostia-Bolling   |   | <b>5. FUNDING NUMBERS</b>   |   |
| <b>6. AUTHOR(S)</b> Michael C. Bishop and Shane H. Derby   |   | <b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>   |   |
| <b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b><br>Naval Postgraduate School<br>Monterey, CA 93943-5000  |   | <b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b><br>N/A  |   |
| <b>9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b><br>NAVFAC Washington<br>1314 Harwood Street, SE<br>Washington Navy Yard, DC 20374-5018   |   | <b>11. SUPPLEMENTARY NOTES</b> The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol Number: N/A. |   |
| <b>12a. DISTRIBUTION / AVAILABILITY STATEMENT</b><br>Approved for public release; distribution is unlimited  |   | <b>12b. DISTRIBUTION CODE</b>   |   |
| <b>13. ABSTRACT (maximum 200 words)</b><br>The researchers of this report argue the cost to outsource government functions may be significantly greater, possibly five times greater, than completing the requirement in-house with federal employees. In accordance with congressional legislation, on October 1, 2010, Bolling Air Force Base and Naval Support Facility Anacostia merged to form Joint Base Anacostia-Bolling (JBAB). The installation occupies over 900 acres and requires an extensive pesticide treatment plan. Currently, the level of service for pesticide treatment is different on Bolling than it is on Anacostia. Bolling is staffed with three full-time civil service entomologists who provide treatment for the 136 buildings and 359 acres of land area Bolling occupies. Anacostia has 74 buildings and 607 acres of land area, of which only two buildings are fully treated, under an existing regional contract. |   |   |   |
| The researchers' goal in producing this report is to help the decision-maker choose the best course of action (retain work in-house versus outsource) among the following alternatives to meet the expanded pest treatment requirement on JBAB. The following is a list of possible actions explored in the report:  |   |   |   |
| <ul style="list-style-type: none"> <li>• Absorb the larger requirement into current in-house capacity;</li> <li>• Outsource the entire pest management and herbicide requirement to a private contractor for all of JBAB;</li> <li>• Utilize contract services to meet the additional requirement (utilizing a hybrid-type contract of both in-house and contractor provided service); or</li> <li>• Hire additional in-house personnel.</li> </ul>  |   |   |   |
| The final product the researchers produce is a Cost-Benefit Analysis to estimate the cost of each alternative. Qualitative factors are identified and built into the CBA to form a more robust conclusion.   |   |   |   |
| <b>14. SUBJECT TERMS</b> Outsourcing Base Operations, Decision Model for Outsourcing Base Operations, Analysis of Alternatives when outsourcing, outsourcing decisions, outsourcing analysis, pest management on military installations, ground maintenance on military installations, joint basing, multi-sector workforce, insourcing, contractor mix.   |   | <b>15. NUMBER OF PAGES</b><br>99  | <b>16. PRICE CODE</b>                   |
| <b>17. SECURITY CLASSIFICATION OF REPORT</b><br>Unclassified   | <b>18. SECURITY CLASSIFICATION OF THIS PAGE</b><br>Unclassified | <b>19. SECURITY CLASSIFICATION OF ABSTRACT</b><br>Unclassified  | <b>20. LIMITATION OF ABSTRACT</b><br>UU |

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)  
Prescribed by ANSI Std. Z39-18

THIS PAGE INTENTIONALLY LEFT BLANK

**Approved for public release; distribution is unlimited**

**A DECISION MODEL FOR MERGING BASE OPERATIONS: OUTSOURCING  
PEST MANAGEMENT ON JOINT BASE ANACOSTIA-BOLLING**

Michael C. Bishop, Lieutenant Commander, Supply Corps, United States Navy  
Shane H. Derby, Lieutenant Commander, Supply Corps, United States Navy

Submitted in partial fulfillment of the requirements for the degree of

**MASTER OF BUSINESS ADMINISTRATION**

from the

**NAVAL POSTGRADUATE SCHOOL**  
**December 2011**

Authors:

---

Michael C. Bishop

---

Shane H. Derby

Approved by:

---

LCDR Bryan Lundgren, Lead Advisor

---

Dr. Dina Shatnawi, Support Advisor

---

William R. Gates, Dean  
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

# **A DECISION MODEL FOR MERGING BASE OPERATIONS: OUTSOURCING PEST MANAGEMENT ON JOINT BASE ANACOSTIA-BOLLING**

## **ABSTRACT**

The researchers of this report argue the cost to outsource government functions may be significantly greater, possibly five times greater, than completing the requirement in-house with federal employees. In accordance with congressional legislation, on October 1, 2010, Bolling Air Force Base and Naval Support Facility Anacostia merged to form Joint Base Anacostia-Bolling (JBAB). The installation occupies over 900 acres and requires an extensive pesticide treatment plan. Currently, the level of service for pesticide treatment is different on Bolling than it is on Anacostia. Bolling is staffed with three full-time civil service entomologists who provide treatment for the 136 buildings and 359 acres of land area Bolling occupies. Anacostia has 74 buildings and 607 acres of land area, of which only two buildings are fully treated, under an existing regional contract.

The researchers' goal in producing this report is to help the decision-maker choose the best course of action (retain work in-house versus outsource) among the following alternatives to meet the expanded pest treatment requirement on JBAB. The following is a list of possible actions explored in the report:

- Absorb the larger requirement into current in-house capacity;
- Outsource the entire pest management and herbicide requirement to a private contractor for all of JBAB;
- Utilize contract services to meet the additional requirement (utilizing a hybrid-type contract of both in-house and contractor provided service); or
- Hire additional in-house personnel.

The final product the researchers produce is a Cost-Benefit Analysis to estimate the cost of each alternative. Qualitative factors are identified and built into the CBA to form a more robust conclusion.

THIS PAGE INTENTIONALLY LEFT BLANK

## TABLE OF CONTENTS

|             |  |           |
|-------------|--|-----------|
| <b>I.</b>   | <b>BACKGROUND AND INTRODUCTION.....</b>  | <b>1</b>  |
| A.          | PURPOSE OF THIS STUDY .....  | 2         |
| B.          | RESEARCH QUESTIONS .....   | 3         |
| 1.          | Primary Research Question .....  | 3         |
| 2.          | Secondary Research Questions .....   | 3         |
| C.          | PROJECT SCOPE AND LIMITATIONS .....  | 3         |
| D.          | RESEARCH FINDINGS AND AMPLIFICATIONS .....   | 4         |
| 1.          | Research Findings (Facts) .....  | 4         |
| 2.          | Amplifications (Definitions) .....   | 4         |
| <b>II.</b>  | <b>LITERATURE REVIEW .....</b>   | <b>7</b>  |
| A.          | DEPARTMENT OF DEFENSE PEST MANAGEMENT PROGRAM....  | 7         |
| 1.          | DoD Pest Management Program-DoD Instruction 4150.07.....   | 7         |
| 2.          | <i>Pest Management Plan, Bolling Air Force Base.....</i>   | 8         |
| B.          | DEFENSE INFRASTRUCTURE AND SOURCING STUDIES .....  | 9         |
| 1.          | <i>Defense Infrastructure: DoD Needs to Periodically Review Support Standards and Costs at Joint Bases and Better Inform Congress of Facility Sustainment Funding Uses .....</i> | 9         |
| 2.          | <i>Sourcing Policy: Initial Agency Efforts to Balance the Government to Contractor Mix in the Multisector Workforce .....</i>  | 10        |
| C.          | QUANTITATIVE AND QUALITATIVE ANALYSIS.....   | 11        |
| 1.          | <i>Statistics for Management and Economics (8th ed.).....</i>  | 11        |
| 2.          | <i>A Primer for Policy Analysis, by Stokey and Zeckhauser (1978) ...</i>   | 11        |
| 3.          | <i>Principles of Economics (4th ed.), by N. Gregory Mankiw (2006).....</i>   | 11        |
| <b>III.</b> | <b>DATA .....</b>  | <b>13</b> |
| A.          | BACKGROUND INFORMATION .....   | 13        |
| B.          | RAW DATA .....   | 13        |
| 1.          | Trouble Call Log.....  | 13        |
| 2.          | Job Order Cost Report.....   | 16        |
| 3.          | Billable Hours.....  | 17        |
| 4.          | Naval District Washington Regional Pest Management Services Contract .....   | 17        |
| 5.          | Regional Task Order .....  | 18        |
| 6.          | Chemical Database.....   | 18        |
| C.          | SUMMARY STATISTICS.....  | 19        |
| 1.          | Trouble Call Log.....  | 19        |
| 2.          | Job Order Cost Report and Billable Hours Data .....  | 22        |
| 3.          | Naval District Washington Regional Pest Management Contract .....  | 22        |
| 4.          | Regional Task Order .....  | 23        |
| 5.          | Chemical Database.....   | 24        |

|  |           |
|--|-----------|
| 6. <b>Grounds Maintenance Costs</b> .....  | <b>25</b> |
| <b>IV.     FRAMEWORK FOR ANALYSIS</b> .....  | <b>27</b> |
| A. <b>METHODOLOGY</b> .....  | <b>27</b> |
| 1. <b>Overview</b> .....   | <b>27</b> |
| 2. <b>Analysis</b> .....   | <b>29</b> |
| a. <i>Status Quo – Calculate Actual Cost Data for Current JBAB In-House Pest Management Operations</i> .....   | <i>29</i> |
| b. <i>Outsource All – Outsource Entire JBAB Pest Management Function to a Private Contractor</i> .....   | <i>30</i> |
| c. <i>Hybrid Support – Utilize In-House Personnel and IDIQ Services for JBAB Pest Management Operation</i> .....   | <i>33</i> |
| d. <i>Expand In-House – Hire Additional Civil Service Personnel to Augment Current Workforce</i> .....   | <i>33</i> |
| B. <b>PRELIMINARY FINDINGS</b> .....   | <b>35</b> |
| 1. <b>Primary Research Question</b> .....  | <b>35</b> |
| 2. <b>Qualitative Analysis (Secondary Research Questions)</b> .....  | <b>36</b> |
| a. <i>What are the Advantages and Disadvantages to Keeping the Current Pest and Herbicide Treatment Function on JBAB In-House (Status Quo)?</i> .....                      | <i>36</i> |
| b. <i>What are the Advantages and Disadvantages to Outsourcing the Entire Pest and Herbicide Treatment Function on JBAB to a Private Contractor (Outsource All)?</i> ..... | <i>37</i> |
| c. <i>What are the Advantages and Disadvantages of Implementing a Multiworkforce Human Capital Strategy as Defined by the GAO on JBAB (Hybrid Support)?</i> .....          | <i>38</i> |
| d. <i>What are the Risks?</i> .....  | <i>39</i> |
| <b>V.     CONCLUSION</b> .....   | <b>41</b> |
| A. <b>SUMMARY</b> .....  | <b>41</b> |
| B. <b>RESULTS</b> .....  | <b>42</b> |
| 1. <b>Final Alternative Analysis Based on Combined Quantitative and Qualitative Factors</b> .....  | <b>42</b> |
| 2. <b>Recommendations for Further Analysis</b> .....   | <b>42</b> |
| <b>APPENDIX A.    NAVAL DISTRICT WASHINGTON REGIONAL PEST MANAGEMENT CONTRACT</b> .....  | <b>45</b> |
| <b>APPENDIX B.    BOLLING AIR FORCE BASE STANDARD OPERATING PROCEDURES</b> .....   | <b>47</b> |
| <b>APPENDIX C.    JOINT BASE ANACOSTIA-BOLLING ORGANIZATIONAL CHART</b> .....  | <b>57</b> |
| <b>APPENDIX D.    OUTSOURCED CONTRACT TO MARATHON INC</b> .....  | <b>59</b> |
| <b>APPENDIX E.    JOINT BASE ANACOSTIA-BOLLING GROUND MAINTENANCE MAP</b> .....  | <b>61</b> |

|  |           |
|--|-----------|
| <b>APPENDIX F. SALARY TABLE FOR “WS” WAGEGRADE PERSONNEL .....</b>   | <b>63</b> |
| <b>APPENDIX G. JOINT BASE ANACOSTIA-BOLLING GROUNDS<br/>MAINTENANCE CONTRACT FUNCTIONAL ASSESSMENT PLAN.....</b> | <b>65</b> |
| <b>LIST OF REFERENCES.....</b>   | <b>75</b> |
| <b>ABOUT THE AUTHORS .....</b>   | <b>77</b> |
| <b>INITIAL DISTRIBUTION LIST .....</b>   | <b>79</b> |

THIS PAGE INTENTIONALLY LEFT BLANK

## LIST OF FIGURES

|           |  |    |
|-----------|--|----|
| Figure 1. | Work-Order Flow Diagram.....                             | 14 |
| Figure 2. | Combined In-House and Contract Work Orders by Month..... | 20 |
| Figure 3. | Combined In-House and Contract Work Orders by Type ..... | 21 |

THIS PAGE INTENTIONALLY LEFT BLANK

## LIST OF TABLES

|           |  |    |
|-----------|--|----|
| Table 1.  | Typical Maximo® Generated Call Center Report .....   | 15 |
| Table 2.  | Job Order Cost Report .....  | 16 |
| Table 3.  | Work Order Totals for JBAB Pest Management Division, October 2010 to June 2011 .....           | 19 |
| Table 4.  | Trouble Call Log Work Orders Grouped by Type.....  | 21 |
| Table 5.  | Summary Statistics for Average Monthly Labor Costs .....                                       | 22 |
| Table 6.  | Contract Solicitation Prices for Naval District Washington Regional Pest Control Services..... | 23 |
| Table 7.  | Monthly Regional Task Orders for JBAB by Dollar Amount.....                                    | 23 |
| Table 8.  | Monthly Dollar Value of Chemicals Applied at JBAB, April 2010–June 2011.....                   | 24 |
| Table 9.  | Summary Statistics for Monthly Chemical Costs, April 2010–May 2011 .....                       | 25 |
| Table 10. | Total Annual Costs for In-House Pest Management Operations .....                               | 29 |
| Table 11. | PWD Washington Contract.....   | 31 |
| Table 12. | PWD Washington Cost per Building.....  | 32 |
| Table 13. | JBAB Projected Outsource Costs .....   | 33 |
| Table 14. | Total Annual Costs for In-House Pest Management Operations with One New Hire .....             | 34 |
| Table 15. | Preliminary Cost Benefit Analysis Table for Alternatives 1–4 .....                             | 35 |
| Table 16. | Final Cost Benefit Analysis Table .....  | 42 |

THIS PAGE INTENTIONALLY LEFT BLANK

## LIST OF ACRONYMS AND ABBREVIATIONS

This list includes common acronyms used throughout this report to describe the private military industry, government agencies, or other military terms.

|           |  |
|-----------|--|
| AFB       | Air Force Base   |
| AFI       | Air Force Instruction                                  |
| BRAC      | Base Realignment and Closure Commission                |
| CBA       | Cost-Benefit Analysis                                  |
| CLIN      | Contract Line Item Number                              |
| COA       | Course of Action                                       |
| CPL       | Capability Performance Level                           |
| DoD       | Department of Defense                                  |
| ELIN      | Exhibit Line Item Number                               |
| EMALL     | Electronic Mall  |
| EPA       | Environmental Protection Agency                        |
| FAIR      | Federal Activities Inventory Reform                    |
| FAP       | Functional Assessment Plan                             |
| FAR       | Federal Acquisition Regulations                        |
| FFP       | Firm-Fixed-Price                                       |
| FTE       | Full-Time Equivalent                                   |
| FY        | Fiscal Year  |
| G&A       | General and Administrative                             |
| GAO       | Government Accountability Office                       |
| HQ AFCESA | Head Quarters, Air Force Civil Engineer Support Agency |
| IDIQ      | Indefinite Delivery Indefinite Quantity                |
| IT        | Information Technology                                 |
| JBAB      | Joint Base Anacostia-Bolling                           |
| KO        | Contracting Officer                                    |
| NAVFAC    | Naval Facilities Engineering Command                   |
| NRL       | Naval Research Laboratory                              |

|           |  |
|-----------|--|
| OMB       | Office of Management and Budget  |
| PWD       | Public Works Department  |
| PWO       | Public Works Officer   |
| SOP       | Standard Operating Procedure   |
| SOW       | Statement of Work  |
| USD(AT&L) | Under Secretary of Defense for Acquisitions, Technology, and Logistics |
| WNY       | Washington Navy Yard   |
| WS-09     | Federal Wage System Pay Grade 09                                       |
| WS-14     | Federal Wage System Pay Grade 14                                       |

## ACKNOWLEDGMENTS

We would like to thank our spouses, Julie Bishop and Valerie Derby, as well as our children, Megan, Grayson, and Morgan Bishop and Tonika Nicole Brown, for their tremendous love, support and encouragement in our writing of this MBA Project. Over the last eighteen months of academic study at the Naval Postgraduate School you sacrificed weekends and family time, that we may complete our coursework and research. Julie, you filled the role of both parents at sporting events, campouts, served as teacher and administrator, and principal of the Bishop clan of homeschoolers. Valerie, you seized this time to complete your training, become licensed, and passed the national board exam for massage therapy, congratulations! You're stronger than you know, and your support is humbling.

We would like to thank our research participants at NAVFAC Washington and Joint Base Anacostia-Bolling: CAPT Worden, Lt. Col McClure, Mr. James Freouf, Mr. Ken Douglas, Capt. Ryan Miller, Mr. Jackie Pitts, and Mr. Jan Luigard. Your cooperation and understanding in fielding our never-ending litany of requests for information is greatly appreciated.

Additionally, we would like to thank the Acquisition Research Program, especially RADM James Green, USN (Ret), Ms. Karey Shaffer, and Ms. Tera Yoder, for providing funding and resources to ensure the success of this MBA project.

Finally, we would like to thank LCDR Bryan Lundgren, SC, USN, and Dr. Dina Shatnawi, for their support, guidance, and encouragement throughout the duration of this project. You inspired us and your dedicated investment in us as students left a lasting impression.

THIS PAGE INTENTIONALLY LEFT BLANK

## **I. BACKGROUND AND INTRODUCTION**

Hiring a private contractor to execute military installation, base, and mission support functions has become common practice. In the researchers' experience serving on a variety of military installations in the United States and overseas, they have found no commonality among which functions are outsourced or why. Each installation has a unique set of challenges that affects the decision to outsource a particular base function to a private contractor. For example, one installation may choose to outsource some or all of its food service functions, while another does not, or uses a hybrid method with active duty servicemen, civil service, or contractors working side by side. On the surface, the advantages to outsourcing the entire function in the short run may be cost and personnel savings—but at the expense of training, experience, continuity, and flexibility. During the Revolutionary War, independent settlers sold paper, bacon, sugar, and the like to Continental Army troops (“Private Battles,” 2008). Today, however, the reliance on the private sector to provide personnel, logistics functions, and even main gate security has never been higher. Concerning contractor performance of government support functions, a Government Accountability Office (GAO) study from 2010 reported that “Congress and the Executive Branch of the United States Government also expressed concern as to whether federal agencies have become over reliant on contractors and have appropriately outsourced services” (Government Accountability Office [GAO], 2010, p. 1).

In response to a congressional mandate, the Office of Management and Budget (OMB) has proposed policy to adopt a single, government-wide definition of inherently governmental functions in accordance with the Federal Activities Inventory Reform (FAIR) Act of 1998. In the 2010 GAO report, a study was completed to help agencies determine the best balance of federal employees to contractor in a multi-sector workforce (GAO, 2010). The GAO did the study to help agencies consider whether functions currently outsourced should be brought in-house, a process known as in-sourcing.

In accordance with congressional legislation, on October 1, 2010, Bolling Air Force Base and Naval Support Facility Anacostia, which share a land mass of approximately 966 acres along the Potomac River, merged to form Joint Base Anacostia-

Bolling (JBAB). The installation requires extensive and effective pesticide treatment. As of October 1, 2010, the public works officer (PWO) is responsible for effective pesticide and herbicide treatment of 136 buildings on a land area of 359 acres. The congressional legislation to merge Anacostia and Bolling into one installation increased his or her scope of responsibility to an additional 74 buildings and 607 acres. The PWO is now responsible for a total of 210 buildings across a land area of 966 acres. His preliminary analysis of this increased scope found that only two buildings on the Anacostia side (building numbers 413 and 418, for a total of 7,664 square feet) were treated regularly for pests, ordered from a regional indefinite delivery indefinite quantity (IDIQ) pest management contract. The PWO was faced with a decision to exercise an option for continued pesticide treatment of these facilities, or to let the option expire and absorb the responsibility with his pest and herbicide treatment division of three in-house employees.

On June 1, 2011, the option expired and pest treatment for all of JBAB is now completed in-house. With the levels of pesticide and herbicide treatment being different on Anacostia than on Bolling, the PWO's decision to let the option expire lent support to establishing a set of choices that could be made in the future if the workload proves overwhelming to the current in-house personnel. Going forward from June 1, 2011, the PWO is now capturing important historical data that will help determine whether the increased treatment requirement can be successfully absorbed into the pest treatment division's current capacity.

#### **A. PURPOSE OF THIS STUDY**

The goal of this research project is to provide analysis to the decision maker at JBAB as to whether he or she should:

- absorb the larger requirement into his current in-house capacity;
- outsource the entire pest management and herbicide requirement to a private contractor for all of JBAB;
- utilize contract services to meet the additional requirement (utilizing hybrid type contract meaning using in-house employees augmented with contracted services from an existing regional contract); or
- hire additional in-house personnel.

## **B. RESEARCH QUESTIONS**

The researchers of this report address the following questions:

### **1. Primary Research Question**

What will it cost to outsource the entire pest and herbicide treatment function on JBAB to a private contractor?

### **2. Secondary Research Questions**

- What are the advantages and disadvantages of keeping the current pest and herbicide treatment function on JBAB in-house?
- What are the advantages and disadvantages of outsourcing the entire pest and herbicide treatment function on JBAB to a private contractor?
- What are the advantages and disadvantages of implementing a multi-workforce human capital strategy on JBAB as defined by the 2010 GAO study?

## **C. PROJECT SCOPE AND LIMITATIONS**

Our project scope is relatively narrow. The researchers used a single regional IDIQ contract, which completely outsourced the pest and herbicide treatment requirement throughout the region, as a benchmark for direct comparison and projection of what it would cost to completely outsource the function on JBAB. The researchers directly compared the total projected cost of outsourcing this function to the costs of each of the four alternatives stated in the purpose above.

This analysis contains a review of the literature that prescribes current DoD policy. The researchers' goal was to keep this literature in mind throughout the analysis and to discuss in this report any possible implications to policy. Next, the researchers present the data collected and discuss the summary statistics extracted from the data. They then present the framework for analysis and the methodology used for calculating costs and benefits. They discuss the variables of interest, which may be unique to this particular outsourcing decision, so that managers faced with peculiarities of their own management issue or decision uncertainty can better understand when a choice to conduct

such a specific analysis such as this one may prove beneficial. Finally, the researchers provide the results of this analysis, make concluding remarks, and offer recommendations for further analysis.

## **D. RESEARCH FINDINGS AND AMPLIFICATIONS**

### **1. Research Findings (Facts)**

While conducting onsite research, the researchers discovered some important physical characteristics that need to be highlighted in this analysis.

- The JBAB Public Works Maintenance Department has three divisions: (1) pest control; (2) gardener, which has two sub-divisions of construction equipment operators and repairman; and (3) maintenance, which employs maintenance mechanics and carpenters. All three divisions work together to carry out pest and herbicide treatment per their Pest Management Plan Standard Operating Procedure (SOP).
- The pest management division shares a building with an unrelated tenant.
- A consolidated call center is employed to catalog all maintenance requests for the department.
- The pest management division is responsible for both pesticide treatments (which include but are not limited to the application of pesticides to prevent a very wide array of insects) and the application of herbicides (which inhibit the growth of weeds, especially around buildings).

### **2. Amplifications (Definitions)**

Some terms and definitions are specific to this project. The researchers provide the following amplification in an effort to clarify how these terms are used throughout the report.

- The terms *pest management*, *pest control*, and *pest division* are interchangeable. For consistency, the researchers most commonly use the term *pest management*.
- *In-house employee* is used universally to describe a full-time equivalent (FTE) government employee. A person directly hired by the United States federal government for pest management has been referred to as (1) a civil service employee, (2) a pest specialist, (3) an entomologist, or (4) organic personnel.

- To understand the breadth of the requirement satisfied by the pest management division, the researchers analyzed two separate, regional IDIQ contracts for applicable costs: (1) pest management and (2) ground maintenance.
- The term *flexibility*, as used in this report, concerns the ability of management to utilize personnel to perform a range of pest management functions at any given time during a given workday. Additionally, the term positively connotes a key attribute of in-house pest management personnel when listing the advantages of maintaining current in-house personnel operations as compared to outsourcing.

THIS PAGE INTENTIONALLY LEFT BLANK

## II. LITERATURE REVIEW

The researchers selected four primary and two secondary literary resources to support this analysis. The first and second primary literary resources are policy documents governing pest management within the Department of Defense (DoD) and JBAB, respectively. The third and fourth primary literary resources are studies conducted by the GAO. In one study, the researchers analyze facility sustainment funding shortfalls to support joint bases; and in the other study the researchers provide guidelines for in-sourcing government functions as they relate to mission support. The researchers used the secondary sources (i.e., Keller, Stokey et al., and Mankiw) to conduct quantitative and qualitative analysis.

The GAO's joint base facility sustainment funding and in-sourcing study directly supports DoD pest management policy, which states, "Use pest management contracts when more cost effective than in-house services" (Under Secretary of Defense for Acquisitions, Technology, and Logistics [USD(AT&L)], 2008, p. 7). By better understanding GAO's suggestion of pest management as a standard for mission support on joint bases and the relationship in-sourcing has in meeting this standard, PWOs can make a more informed decision for conducting pest management on JBAB.

### A. DEPARTMENT OF DEFENSE PEST MANAGEMENT PROGRAM

#### 1. DoD Pest Management Program-DoD Instruction 4150.07

This instruction prescribes policies and procedures for installation commanders to approve, maintain, implement, coordinate, and update their installation pest management program annually. The instruction states, "The Department of Defense shall use pest management contracts when cost-effective or when advantageous for non-routine, large scale, or emergency services, especially when specialized equipment or expertise is needed" (USD[AT&L], 2008, p. 21).

The researchers' interpretation of the quote in the previous paragraph is the premise of their research—to determine what alternative produces the most cost-effective solution and best value for pest management on JBAB. The DoD Pest Management

Program instruction 4150.07 directs installation commanders with specific guidance for accomplishing effective pest management outsourcing. The instructions states:

Pest management consultants shall review and technically approve contract documents for pest management operations, including augmentation contracts; to ensure that appropriate pest management standards and integrated pest management are specified. The Military Services shall encourage installations that lack expertise in pest management to request the services of a DoD pest management consultant to develop the technical portions of pest management contracts. . . . Pest management consultants can act as technical consultants during the performance of contracted work. (USD[AT&L], 2008, p. 21)

This study revealed a desire by program stakeholders with interest in policy change commensurate with the guidance outlined in the DoD Instruction 4150.07 to uncover impacts to policy with regard to environmental management. However, the researchers emphasize quantitative analysis with some qualitative discussion points. The researchers' will suggest where further research exists or may be conducted to analyze a topic of this nature in the concluding chapter.

## **2. Pest Management Plan, Bolling Air Force Base**

The *Pest Management Plan*, published in 2009, for Bolling Air Force Base is the principal guiding document and includes the standard operating procedure for pest management on JBAB. This standard operating procedure (see Appendix B) is a 10-section comprehensive document that covers the how-to in pest management on JBAB (U.S. Air Force, 2008). It states the objectives of the pest management plan and describes the mission and responsibilities of assigned personnel. It describes health and safety measures, identifies applicable public laws and regulations, describes how to coordinate with other organizations and agencies, and lists special environmental considerations to include measures of compliance with the Environmental Protection Agency's (EPA) memorandum of understanding. The *Pest Management Plan* states:

Bolling Air Force Base (AFB) will use pest management service contracts when it is in the best interest of the government. These contracts are prepared in accordance with applicable Federal Acquisition Regulations (FAR) and requirements of DoD Instruction 4150.07, which are incorporated in Air Force Instruction (AFI) 32-1053. Statements of Work

(SOW) or performance work statements will be reviewed, coordinated, and approved prior to awarding a contract by the Entomology Shop Supervisor at Bolling AFB and the Pest Management Consultant at HQ AFCESA. (U.S. Air Force, 2008)

## **B. DEFENSE INFRASTRUCTURE AND SOURCING STUDIES**

### **1. *Defense Infrastructure: DoD Needs to Periodically Review Support Standards and Costs at Joint Bases and Better Inform Congress of Facility Sustainment Funding Uses***

Although pest management is only one functional area of joint base support, it is important to know the level of service required for pest management at each joint base. A 2009 GAO study identified 47 installation support functions. Pest management services is number 32 in that study's findings. Furthermore, there are 267 support standards identified in the report that are to be met for joint basing; one is directly linked to pest management services. Concerning DoD's efforts to standardize support on joint bases, the study stated:

DoD has made a comprehensive effort to ensure that the 12 planned joint bases deliver consistent installation support, but support costs are expected to increase, at least in the short term, rather than decrease as expected by the 2005 BRAC Commission. DoD's efforts to ensure consistent support have included the issuance of detailed guidance, which for the first time provided common installation support definitions and standards, and the establishment of mechanisms to help ensure that the joint bases comply with guidance requiring that the bases deliver installation support in accordance with the new definitions and standards. However, instead of decreasing, support costs at the joint bases are expected to increase primarily because past funding for installation support has been insufficient to provide support at all levels called for by either existing or new common service standards, and in some instances the military services' approach to implementing joint basing will result in additional administrative costs and loss of some existing installation support efficiencies. In the long term, DoD officials stated that the increased installation support costs might be at least partially offset as best practices and new operational efficiencies are identified and adopted over time. However, on the basis of the higher installation support cost estimates from the initial joint bases and as long as installation support is delivered in accordance with the new support standards, it is unclear whether joint basing will result in any actual saving. (GAO, 2009)

## 2. *Sourcing Policy: Initial Agency Efforts to Balance the Government to Contractor Mix in the Multisector Workforce*

The GAO report, concerning the decision to outsource government functions:

A March 2009 Presidential memorandum tasked the Office of Management and Budget (OMB) with issuing guidance in a number of areas related to addressing challenges in the federal contracting environment, including when it is appropriate for the government to outsource services and when it is not. (GAO, 2010, p. 1)

This GAO study served as the basis for this analysis and helped frame the business case used in this paper in the simplest of terms—to outsource or not to outsource? A statistic specifically related to this question was described in the study.

The study found:

Government contracting has more than doubled to reach over \$500 billion annually since the panel has issued this report. This increased reliance on contractors to perform agency missions increases risk that government decisions can be influenced by contractor employees, which can result in a loss of control and accountability. Agencies buy services that range from basic operational support, such as custodial and landscaping, to more complex professional and governmental functions...Inherently governmental functions require discretion in applying government authority or value judgments in making decisions for the government, and as such they should be performed by government employees, not private contractors. (GAO, 2010)

The GAO study points to ownership and vested interest of mission support; therefore, it may be important to keep this study in mind when considering any outsourcing decision, especially in light of the substantial annual growth of contractor-provided services. When set in the context of pest management as a function of installation support, it is important to analyze which functions are actually being accomplished specific to the installation and whether these functions are consistent with standards prescribed in the DoD's joint basing policy. If so, on what basis will it be justified to perform these functions differently?

## C. QUANTITATIVE AND QUALITATIVE ANALYSIS

### 1. *Statistics for Management and Economics* (8th ed.)

The eighth edition of *Statistics for Management and Economics* was specifically selected because of its robust introductory chapter. The text is very suitable for the graduate student who has not directly studied statistics for some time. The first chapter provides helpful insight and reintroduces the science of collecting, organizing, modeling, interpreting, and presenting data. The text was used only to draw ideas in how to present data. With this reference in mind the researchers employed basic descriptive statistic and graphical techniques to categorize and view data to support a cost comparison of current in-house costs versus outsourcing the entire function.

### 2. *A Primer for Policy Analysis*, by Stokey and Zeckhauser (1978)

*A Primer for Policy Analysis* text was selected by the researchers only to gain insight into tabulating costs and benefits. With this reference in mind, the researchers weighed the costs and benefits, and summarized the outcomes using a table developed in Microsoft Excel. The goal in drawing insight from this text assisted the researchers in presenting the concluded findings of this study in the simplest form available—a summary table.

### 3. *Principles of Economics* (4th ed.), by N. Gregory Mankiw (2006)

N. Gregory Mankiw's *Principles of Economics* lists and describes each of his 10 principles of economics. The researchers specifically used his third principle “rational people think at the margin” as a standard of analysis in which the decision maker will only take action if the marginal benefit to complete the pest management mission on JBAB in a different manner exceeds the marginal costs of how it is currently being done.

THIS PAGE INTENTIONALLY LEFT BLANK

### III. DATA

This discusses the raw data collected for their analysis. The Naval Facilities Engineering Command (NAVFAC) in Washington, JBAB Public Works Division, and other supporting administrative offices provided the data. In the first section of this chapter the researchers present the data extracted from the JBAB Public Works trouble call tracking system, which includes cost data and applicable labor rates. Also present is analogous contract cost data that they use in subsequent chapters for a side-by-side comparison of a base in the same geographical area that has outsourced its entire pest management function. The next section outlines the summary statistics of the data collected.

#### A. BACKGROUND INFORMATION

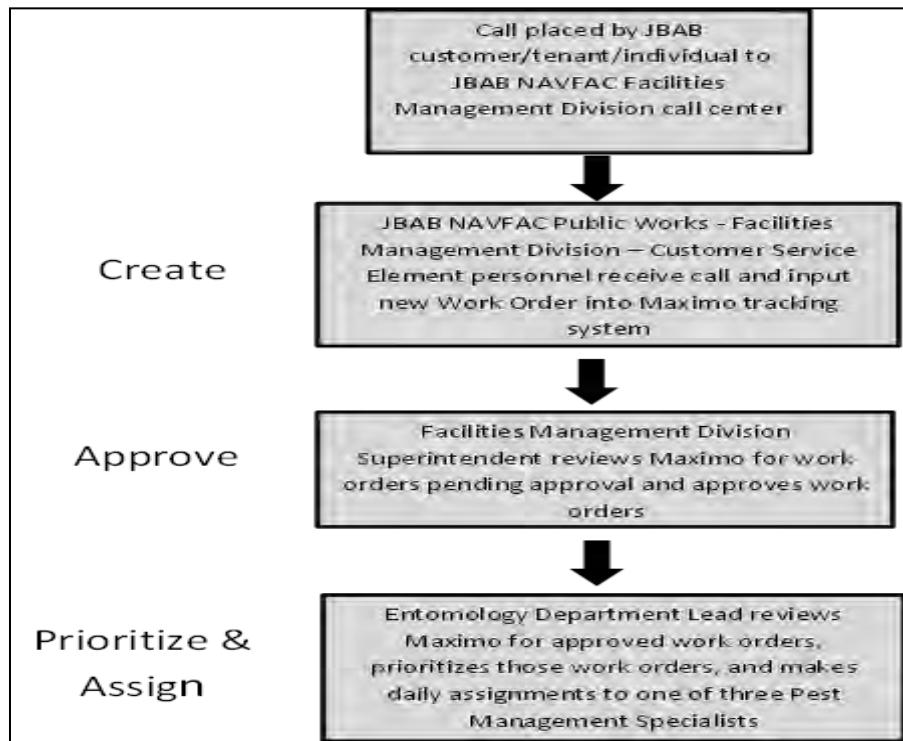
The JBAB Maintenance Department is the primary source from which the researchers collected data. The pest management division is one of three divisions that serve in the maintenance department. The maintenance department reports to the Maintenance Branch Head and then reports to the PWO. The maintenance departments, specifically those associated with administration and oversight of the various divisions, are cross-functional. The pest management division, gardener division, and maintenance division share a call center that is a single-point reporting and tracking database system acquired from a commercial market IBM Corporation product named Maximo®. The researchers obtained other data collected, such as contract, cost, and other accounting data, from systems internal to the NAVFAC Washington or provided by the financial management division co-located in the JBAB Public Works Building.

#### B. RAW DATA

##### 1. Trouble Call Log

The *trouble call log* is the primary means for documenting maintenance support issues reported from base tenants. The trouble call log is populated by call center personnel to document incoming pest management calls from JBAB tenants, personnel,

and commands. The trouble call log is actually a spreadsheet generated from the computer-based tracking system called Maximo® that call center personnel access at their individual workstations. This tracking system is housed on a local network and is accessible by users with hierachal rights and access privileges. Figure 1 depicts the flow of information from an incoming trouble call to the call center and ultimately into the operational tracking system.



**Figure 1. Work-Order Flow Diagram**

At the time of the call, personnel query the customer for pertinent information and enter that information into the system that then assigns a job order number. The public works supervisor then views that job order number in the tracking system (see Appendix C) and assigns the work order to the appropriate personnel based on decision variables, including technician availability, workload, and priority. The spreadsheet in Table 1 is an example of an inquiry report generated from the Maximo® reporting system and is representative of data input by call center personnel.

| Work Order | Work Center (WC) # (Actions: W1-LP9-E-00000) | Description  | Reported Date | Reported Time | Approved Inv | Approved Date | Start Start | Actual Start Time | Actual Finish | Actual Finish Time | Location  | Status |
|------------|--|--|---------------|---------------|--------------|---------------|-------------|-------------------|---------------|--------------------|-----------|--------|
| KKB92      | WCJP5E                                       | ANIMAL RUNNING THE CEILING KNOCKING DOWN CEILING TILES | 3/11/11       | 10:28:48 AM   | 3/15/11      | 9:32:00 AM    |             |                   |               |                    | JBAB-520  | CAN    |
| KH7G4      | WCJP5E                                       | ANIMAL RUNNING THE CEILING KNOCKING DOWN CEILING TILES | 12/15/10      | 7:02:40 AM    | 12/15/10     | 7:16:00 AM    | 12/15/10    | 8:00:00 AM        | 12/17/10      | 2:12:48 PM         | N61142    | CLOSE  |
| KH6MP      | WCJP5E                                       | ANIMAL RUNNING THE CEILING KNOCKING DOWN CEILING TILES | 12/14/10      | 8:18:14 AM    | 12/21/10     | 8:51:00 AM    | 4/21/11     | 8:09:14 AM        | 4/21/11       | 8:09:14 AM         | JBAB-1310 | COMP   |
| KHPOL      | WCJP5E                                       | ANIMAL RUNNING THE CEILING KNOCKING DOWN CEILING TILES | 1/6/11        | 9:31:05 AM    | 1/10/11      | 7:58:00 AM    | 1/10/11     | 8:50:29 AM        | 1/10/11       | 12:30:00 PM        | JBAB-17   | CLOSE  |
| KHSWD      | WCJP5E                                       | ANIMAL RUNNING THE CEILING KNOCKING DOWN CEILING TILES | 12/13/10      | 12:52:11 PM   | 12/17/10     | 10:17:00 AM   |             |                   |               |                    | JBAB-3618 | CAN    |
| KHPHP      | WCJP5E                                       | ANIMAL RUNNING THE CEILING KNOCKING DOWN CEILING TILES | 1/6/11        | 11:57:44 AM   | 1/10/11      | 7:59:00 AM    | 1/10/11     | 8:56:29 AM        | 1/10/11       | 12:00:00 PM        | JBAB-1300 | COMP   |

**Table 1. Typical Maximo® Generated Call Center Report**

Table 1 is an extract of the *Call Center Report*. The columns represent a few of the reporting fields that can be extrapolated from the system when making a database query. For the purposes of this report, the researchers chose the fields (e.g., columns from the larger report) from the *Call Center Report* that would best allow them to generate summary statistics applicable to their analysis. While numerous other columns of the report included call center statistics, the columns with required information only were retained. These fields include reported date, actual start date, and actual finish date, as well as the type of trouble call based on the call center representative's issue description as input in the description field. The column titled *Work Center* contains a system-generated code based on the assignment of work orders to either in-house personnel or to those outsourced to the civilian contractor.

## 2. Job Order Cost Report

The *Job Order Cost Report* (see Table 2) is a report that can be filtered by employee name to determine annual labor costs associated with the pest management function at JBAB. This spreadsheet depicts labor hours for each of the three full-time equivalent (FTE) entomologists and the associated labor hours and costs per work order. Table 2 is an extract of the larger *Job Order Cost Report* showing labor hours per individual work order. The aggregated annual labor hours per employee were calculated using these individual job order labor hours and appear in the summary statistics section of this report (see Table 5).

| EMPLOYEE NAME       | EXPENSE ELEMENT | EXPENSE ELEMENT DESCRIPTION        | LABOR HOURS | ACTUAL LABOR | ACTUAL OT LABOR | ACTUAL ACCEL LABOR | TOTAL ACTUAL LABOR |
|---------------------|-----------------|------------------------------------|-------------|--------------|-----------------|--------------------|--------------------|
| ADRIANI, DOMINICK M | 1111            | Full Time Permanent Salaries/Wages | 3.50        | \$98.07      | \$0.00          | \$57.41            | \$281.20           |
| ADRIANI, DOMINICK M | 1111            | Full Time Permanent Salaries/Wages | 2.00        | \$56.04      | \$0.00          | \$32.81            | \$160.69           |
| AHMAD, IDRIS Y      | 1111            | Full Time Permanent Salaries/Wages | 4.00        | \$112.08     | \$0.00          | \$76.68            | \$368.96           |
| AHMAD, IDRIS Y      | 1111            | Full Time Permanent Salaries/Wages | 8.00        | \$224.16     | \$0.00          | \$153.35           | \$737.91           |
| BAIR, JAMES M       | 1111            | Full Time Permanent Salaries/Wages | 2.00        | \$59.14      | \$0.00          | \$38.34            | \$184.48           |
| BAIR, JAMES M       | 1111            | Full Time Permanent Salaries/Wages | 8.00        | \$236.56     | \$0.00          | \$153.35           | \$737.91           |

**Table 2. Job Order Cost Report**

The cost report in Table 2 was significant to this study in that it helped the researchers determine the total amount of time (labor hours) expended annually in performing pest management functions in an effort to produce an average expected labor-hour cost. The researchers then used this average labor-hour cost in their decision model to estimate the total cost of performing this function in-house on JBAB.

### **3. Billable Hours**

The Job Order Cost Report also contains the current rate at which an employee's time is billed. An employee can filter the spreadsheet to find the total hours per day that an employee billed his or her time to a work order. Total billable labor is represented in this cost report by a summation of key cost elements, which include administrative labor overhead, production overhead labor, regular labor, and accelerated labor. The researchers obtained the data from the management system that the financial management division provided. The significance of this billable hour data is in its representation of the total number of labor hours that the in-house operation requires in accomplishing the pest management function at JBAB. The researchers used this data to determine whether the amount of hours that current employees billed meets or falls short in the amount of pest and herbicide control now required at JBAB.

### **4. Naval District Washington Regional Pest Management Services Contract**

The Regional Pest management Service Contract is an award of a firm-fixed-price (FFP) contract plus an IDIQ addendum. The FFP portion represents minimum pest management support services to be ordered with the private contractor. The FFP portion represents minimums for: 1) scheduled pest management services at specific buildings at specific sites, and 2) emergency/service calls anywhere at sites. The IDIQ portion of the contract represents "unscheduled pest control services at sites." The contract was awarded to Marathon Inc., a civilian pest management service provider. The contract provides service for all bases and sites that the Naval District Washington region represents, including the Naval Support Facility Anacostia. Sections of the contract consist of total contract price, including total prices for a base year and four option years,

separate base year and option year tabs each including costs for civilian contractor pest management services delineated by site, and FFP and IDIQ tabs for each of the related periods listing the line item costs of the contract. The actual awarded contract to Marathon Inc. occurred on 14 May 2009, as a result of a competitive procurement process and is included in Appendix D. The contract is currently in the second option period which spans 1 June 2011–31 May 2012. The second option period has not been exercised for JBAB pest management support.

## **5. Regional Task Order**

The purpose of the IDIQ portion of the pest management contract is to provide a means of augmenting the in-house personnel when workload demand exceeds organic capacity. Task orders are placed with the contractor for single treatment services as needed and are billed per job in accordance with the contract line item for a particular type of service. Neither materials used by the contractor in support of a task order nor the labor hours associated are itemized in the billable per treatment costs. The regional task order spreadsheet contains the task orders awarded against the IDIQ portion of the contract with Marathon Inc. for the period of interest. The amount obligated for each task order is listed by date.

## **6. Chemical Database**

The federal government requires that all chemicals dispensed for the purpose of pest management at the government and commercial level be documented by geographic region. To aid in the tracking of these chemicals, a web-based database was implemented and made available to government pest management operations. The pest management division at JBAB uses this reporting mechanism for chemicals used by both in-house and contractor personnel. The researchers were provided with a report from this system by the entomologists that allowed them to determine the type and quantity of chemicals consumed at JBAB. Using market research verified by subject matter experts to conduct a cost analysis of these chemicals, the researchers were able to determine the costs associated with each chemical and the total annual amount of funds expended for chemicals on JBAB.

## C. SUMMARY STATISTICS

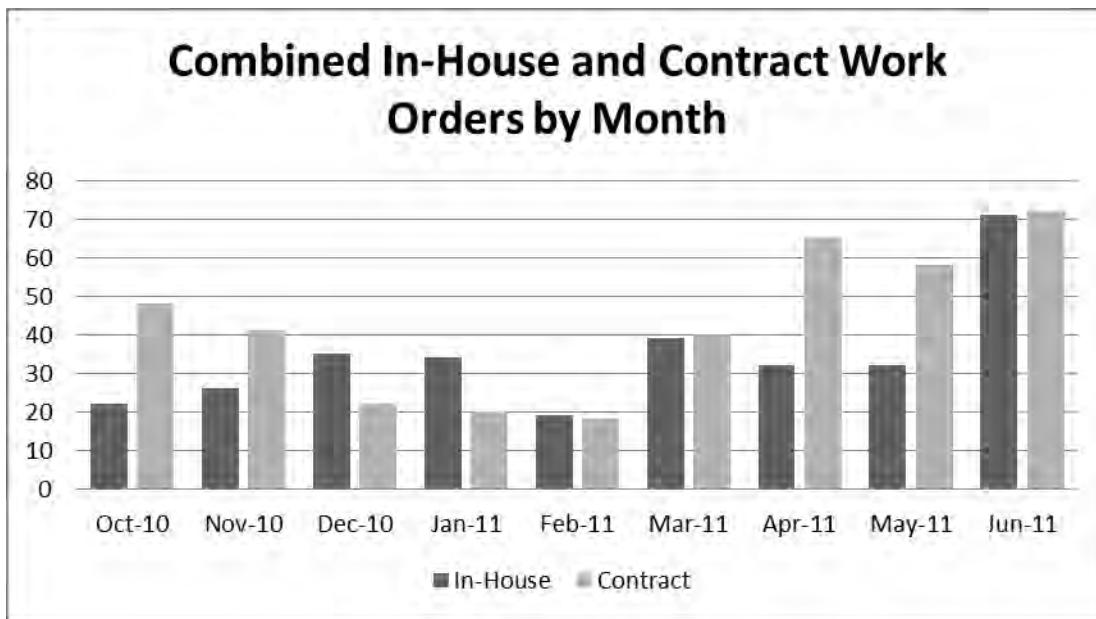
### 1. Trouble Call Log

To derive the metric the researchers needed in their model that represented the total monthly and annual demand for workload, the researchers used the trouble call log and calculated summary statistics for periodic workload. Table 3 and Figures 2 through 4 represent the monthly workload by number of work orders reported in-house, work orders deferred to the service contractor, and the total number of all reported work orders for these two combined, respectively. Of note is that throughout this report, data specifically for the month of June 2011 was only partially available when this study was conducted. The data however, does represent a majority (two-thirds) of that month.

| # of Work Orders: |     | Work Orders by Month |        |        |        |        |        |        |        |        |  |
|-------------------|-----|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|                   |     | Oct-10               | Nov-10 | Dec-10 | Jan-11 | Feb-11 | Mar-11 | Apr-11 | May-11 | Jun-11 |  |
| In House:         | 310 | 22                   | 26     | 35     | 34     | 19     | 39     | 32     | 32     | 71     |  |
| Contract:         | 384 | 48                   | 41     | 22     | 20     | 18     | 40     | 65     | 58     | 72     |  |
| Total:            | 694 | 70                   | 67     | 57     | 54     | 37     | 79     | 97     | 90     | 143    |  |

**Table 3. Work Order Totals for JBAB Pest Management Division, October 2010 to June 2011**

Figure 2 represents the data from Table 3 in graph format. In-house work orders by month are compared in a side-by-side comparison with contract work orders by month.



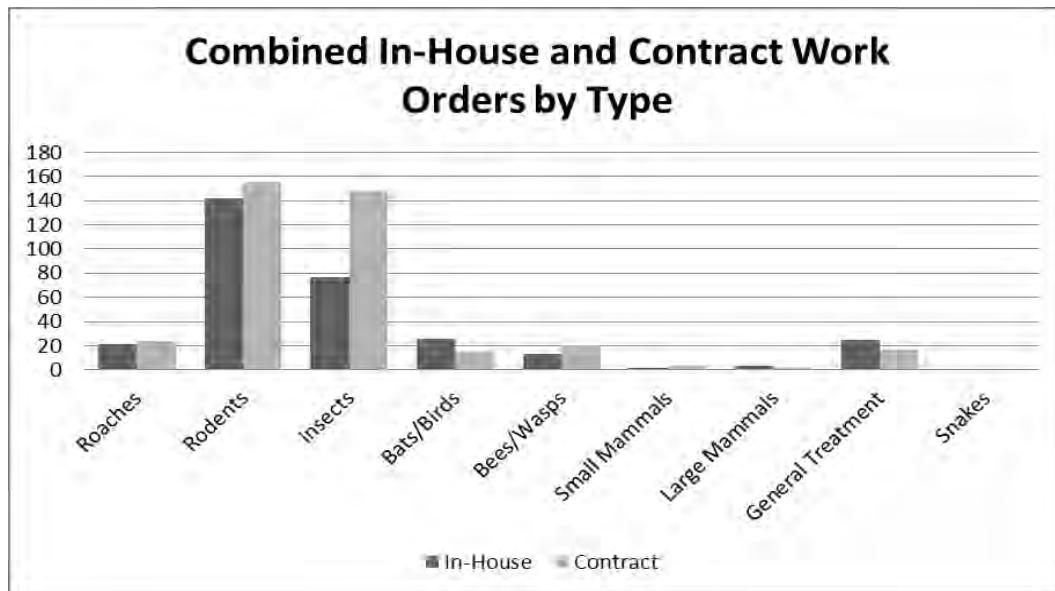
**Figure 2. Combined In-House and Contract Work Orders by Month**

The researchers also used the trouble call log to determine the type of work orders to which technicians, both in-house and contract, were responding. The researchers used this data to perform a cost analysis of commercially available pest management costs that varied by the type of pest management service performed. Using the description column from the call log, the researchers assigned each type of issue a numerical code (1 through 9) based on the key words in the description. These codes are depicted in Table 4, which is an extract of the report.

| Work Order | Type (1=roaches, 2=rodents, 3=insects, 4=bats/birds, 5=bees/wasps, 6=sml mammals, 7=lrn mammals, 8=gnrl trtmnt; 9=snakes) | Description   | Work Center (WCJP5E=In House; WCCP24=Contract) | Work Type |
|------------|---|---|--|-----------|
| KFP9V      | 1   | ROACH WAS FOUND   | WCJP5E   | SERVICE   |
| KGSXN      | 1   | NEED BUILDING SPRAYED FOR ROACHS  | WCJP5E   | SERVICE   |
| KK4LW      | 2   | CUBE 2E1026, REMOVE MOUSE & RESET TRAPS.                                      | WCCP24   | SERVICE   |
| KK7BF      | 2   | ROOM 1W4010, REMOVE MOUSE & RESET TRAPS.                                      | WCCP24   | SERVICE   |
| KK7J8      | 2   | SET MOUSE TRAPS MARA0119 ROOM 1W4010  | WCCP24   | SERVICE   |
| KKBGJ      | 2   | 1W2503 & 1W2017 AREA SMELLS OF DEAD RODENT. CHECK AREA, REMOVE & RESET TRAPS. | WCCP24   | SERVICE   |
| KKDRR      | 2   | ROOM 1W3839 PICK UP DEAD MOUSE RESETTRAP MARA0119                             | WCCP24   | SERVICE   |

**Table 4. Trouble Call Log Work Orders Grouped by Type**

The researchers then grouped the work orders based on these codes into tables. The tabular results are depicted in Figure 3 and represent totals for the period of consideration (October 2010–June 2011). The in-house work orders by type are compared side-by-side contract work orders by type.



**Figure 3. Combined In-House and Contract Work Orders by Type**

## 2. Job Order Cost Report and Billable Hours Data

Summary statistics for the Job Order Cost Report are represented as billable hours. Based on the summary of data found in the Job Order Cost Report, the researchers determined the total number of hours billed by in-house entomologists for the three months of given available data, the average number of billed hours in those months, and the average total monthly labor costs based on the known hourly labor cost. The hourly labor cost applied in this calculation was provided to the researchers during the site visit and is comprised of: G&A overhead labor rate, production overhead rate, regular labor rate, and a regular accelerated labor rate. The sum total of these rates is \$92.24 and is the average cost per labor hour rate used by regional comptrollers in calculating labor costs. Table 5 depicts the summary statistics for this data.

| Month       | Mar-11 | Apr-11 | May-11 | Avg. Billable Hours per Month: | 274.40  |
|-------------|--------|--------|--------|--------------------------------|---------|
| Total Hours | 299.70 | 236.60 | 286.90 | Avg. Cost per Labor Hour:      | \$92.24 |

**Table 5. Summary Statistics for Average Monthly Labor Costs**

## 3. Naval District Washington Regional Pest Management Contract

The regional contract for pest management services data is summarized in Table 6. The table represents the total government-projected costs for the FFP and IDIQ portions of the pest management services contract for the base period plus four option periods. Table 6 also shows annual totals, as well as totals for all periods for FFP and IDIQ.

| <b>N40080-09-D-0474</b><br><b>REGIONAL PEST CONTROL SERVICES</b><br><b>AT NAVAL DISTRICT WASHINGTON</b> |                        |                        |                        |  |  |
|---|------------------------|------------------------|------------------------|--|--|
|   | <b>Fixed-Price</b>     | <b>IDIQ</b>            | <b>Totals</b>          |  |  |
| <b>Contract Base Period</b>   | \$ 255,170.54          | \$ 206,640.25          | \$ 461,810.79          |  |  |
| <b>1st Contract Option Period</b>   | \$ 268,592.28          | \$ 352,931.63          | \$ 621,523.91          |  |  |
| <b>2nd Contract Option Period</b>   | \$ 282,737.84          | \$ 365,388.78          | \$ 648,126.62          |  |  |
| <b>3rd Contract Option Period</b>   | \$ 297,623.50          | \$ 378,483.15          | \$ 676,106.65          |  |  |
| <b>4th Contract Option Period</b>   | \$ 313,292.36          | \$ 392,223.88          | \$ 705,516.24          |  |  |
| <b>Total</b>  | <b>\$ 1,417,416.52</b> | <b>\$ 1,695,667.69</b> | <b>\$ 3,113,084.21</b> |  |  |

**Table 6. Contract Solicitation Prices for Naval District Washington Regional Pest Control Services**

#### 4. Regional Task Order

The summary data for regional task orders represents task order totals for JBAB only. Table 7 shows the total number of task orders the pest management division at JBAB ordered against the IDIQ services contract in a given month, as well as the total dollar amount of those orders. As previously discussed, contractor provided services are reported as total task order costs per service/treatment. Labor hours and materials used are not reported by the contractor for services rendered. The following table is separated into two sections, an upper row and a lower row. The upper row represents task order data for fiscal year (FY) 2010 and the lower row represents data for FY 2011.

| <b>Regional Task Orders (JBAB Only)</b> |               |               |               |               |               |               |               |               |               |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|   |               |               |               | <b>FY</b>     |               |               |               |               |               |
| Month                                   | <u>Mar-10</u> | <u>Apr-10</u> | <u>May-10</u> | <u>Jun-10</u> | <u>Jul-10</u> | <u>Aug-10</u> | <u>Sep-10</u> |               |               |
| Total # of Task Orders                  | 3             | 0             | 1             | 1             | 1             | 2             | 5             |               |               |
| Total Obligated                         | \$24,607.64   | \$0.00        | \$2,612.40    | \$2,414.70    | \$106,049.00  | \$12,380.35   | \$31,723.68   |               |               |
| <b>FY</b>                               |               |               |               |               |               |               |               |               |               |
| Month                                   | <u>Oct-10</u> | <u>Nov-10</u> | <u>Dec-10</u> | <u>Jan-11</u> | <u>Feb-11</u> | <u>Mar-11</u> | <u>Apr-11</u> | <u>May-11</u> | <u>Jun-11</u> |
| Total # of Task Orders                  | 0             | 1             | 0             | 0             | 4             | 0             | 1             | 0             | 0             |
| Total Obligated                         | \$0.00        | \$4,395.50    | \$0.00        | \$0.00        | \$33,885.20   | \$0.00        | \$6,547.00    | \$0.00        | \$0.00        |

**Table 7. Monthly Regional Task Orders for JBAB by Dollar Amount**

Of note in Table 7 are the total obligated task order dollar amounts when compared to the reported total work orders outsourced for contractor support shown in Table 3. Significant numbers of contractor works orders are shown in Table 3 for the months of October 2010 through June 2011 costs should be associated with these job orders. However, Table 7 does not show the same number of task orders as shown in Table 3 and even reports no task orders in several of the reported months. The issue the researchers concluded and verified with JBAB technicians is that the Regional Pest Management Contract continued to be used by other sites in the same region as JBAB but was reported as JBAB work orders as shown in Table 3. The assumption made by the researchers is that there is an error in reporting but that the dollar amounts obligated specifically for JBAB for contractor support utilized under the IDIQ are correctly reported in Table 7. Furthermore, the researchers verified that the Pest Management operation at JBAB is not utilizing the contractor under the IDIQ contract for any services as of May 2011.

## 5. Chemical Database

The researchers analyzed the chemical database for reported chemicals applied at JBAB from April 2010 through June 2011. Using market research verified by the subject matter expert pest management lead technician to apply unit costs for each chemical applied, the researchers determined the dollar amount for all chemicals applied during each of the months in this period. Again, the month of June represents partial data. Table 8 shows these monthly amounts.

| Dollar Value of Chemicals Applied by Month |               |               |               |               |               |               |               |               |  |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--|
| <u>Apr-10</u>                              | <u>May-10</u> | <u>Jun-10</u> | <u>Jul-10</u> | <u>Aug-10</u> | <u>Sep-10</u> | <u>Oct-10</u> | <u>Nov-10</u> | <u>Dec-10</u> |  |
| \$89,912.07                                | \$118.58      | \$23,501.98   | \$86.29       | \$7.20        | \$45.90       | \$136.82      | \$31.34       | \$44.83       |  |
| <u>Jan-11</u>                              | <u>Feb-11</u> | <u>Mar-11</u> | <u>Apr-11</u> | <u>May-11</u> | <u>Jun-11</u> |               |               |               |  |
| \$0.00                                     | \$172.02      | \$405.56      | \$55,128.40   | \$78,782.92   | \$8,853.79    |               |               |               |  |

**Table 8. Monthly Dollar Value of Chemicals Applied at JBAB, April 2010–June 2011**

Based on these monthly quantities, the researchers calculated summary statistics, as shown in Table 9. The data suggests that months leading into summer (April through June) are the months having the highest workload as represented by the months with the highest dollar values of chemicals used. The researchers use this fact later in their analysis as basis for justifying current manning levels that are able to meet the increased workload during these months.

| <b>April 2010 - May 2011</b> |              |
|------------------------------|--------------|
| Mean                         | \$17,740.99  |
| Standard Error               | \$8,604.96   |
| Median                       | \$127.70     |
| Standard Deviation           | \$32,196.81  |
| Range                        | \$89,912.07  |
| Minimum                      | \$0.00       |
| Maximum                      | \$89,912.07  |
| Sum                          | \$248,373.91 |
| Observations                 | 14           |

**Table 9. Summary Statistics for Monthly Chemical Costs, April 2010–May 2011**

The summary statistics in Table 9 show a mean for average monthly chemicals costs for materials used on JBAB as \$17,740 with a range from \$0 to \$89,912 and a standard deviation of \$32,196. The number of observations pertains to the number of months, fourteen, from which the data was derived.

## **6. Grounds Maintenance Costs**

Grounds maintenance, in the form of ground weed control, is a function of pest management and is performed concurrently with entomologist duties. In this regard, work orders can be submitted to the call center in the same manner as regular pest management issues. For the purpose of outsourcing this work requirement, a separate

contract from the regional pest management contract was established. The contract line item capturing this requirement is titled *bare ground weed control*, and costs associated with this function are \$125.00 per 1,000 square feet of area treated. This contract cost is not included in the development and presentation of the researchers' framework for analysis.

## IV. FRAMEWORK FOR ANALYSIS

### A. METHODOLOGY

#### 1. Overview

The methodology used to answer the research question was borrowed from the *program evaluation literature*, where we compared the differences within an installation across different courses of action (COAs) or alternatives (Imbens & Wooldridge, 2008). The researchers did so by comparing costs for each possible alternative below for a comparable installation. Ideally, we would like to have analyzed differences in costs from each alternative for the subject installation (e.g., JBAB). However, we were only able to observe the costs associated with the *Status Quo* alternative, not all alternatives. Therefore, we constructed a counterfactual by using cost data from a similar size installation (e.g., PWD Washington Navy Yard) under the assumption that both installations have identical characteristics. The researchers used the data from Chapter III to determine the best course of action for JBAB's pest management operation.

The costs associated for the four different alternatives are based on current in-house employee time and material usage and existing contract cost elements of the region's IDIQ contract. These alternatives include the following:

- *Status Quo*—total JBAB costs as determined from actual cost data for labor time and materials expended during the most recent reporting periods by current in-house operations at JBAB exclusive of all contractor support;
- *Outsource All*—annualized costs determined for sole contractor pest management operations on JBAB by comparing existing regional FFP and IDIQ cost elements for the buildings grouped with Washington Navy Yard (WNY) in attachment J of the regional contract, and using those costs as a basis for calculating like services at JBAB;
- *Hybrid Support*—total estimated costs for a hybrid-type contract provided pest management operation consisting primarily of in-house government support with ad-hoc, IDIQ-type contractor support; and
- *Expand In-House*—total estimated costs for hiring additional civil service personnel to augment the current level of civil service labor.

The costs associated with the first of these four alternatives were determined by using the reported expenditures and labor costs provided for JBAB. The next two alternatives involved analysis of cost elements in the existing regional IDIQ contract, which contains both an FFP and IDIQ cost schedule by location defined in attachment J of the contract. Line items 1 through 19 of Attachment J of the regional contract list buildings at WNY, Naval Research Laboratory (NRL), Anacostia, Marine Barracks, and Naval Observatory. Because these buildings were both grouped together in the contract and located throughout the region, the researchers felt it was a good fit for cost analysis, as they represented the price agreed upon between the government and contractor in which the work could be completed as stated in the contract. The reasoning in this choice of analysis was to calculate the cost of service already being conducted in the region by a private contractor, then to use those costs to determine a good estimate if the same level of service was provided throughout JBAB. And because the contract specifically lists the number of buildings and the square footage as the basis for determining costs, and because the primary request source for pest treatment comes from building occupants, the researchers selected cost as a function of buildings to determine projected costs on JBAB. For some of the data elements, the costs used are representative of data ranging from a full twelve months to as few as three months. The limited data is a result of not having historical databases readily available to be queried and/or having data missing from reporting archives. With these facts established, the researchers utilized the available data, kept all dollars in *then year* dollars, and forecasted to an annualized basis.

Certainly, this methodology introduced assumptions that include, among others, the ability of contractors to logically meet the requirement regardless of geographic location, availability of competitive sources of contractor support, or similar acreage and improved structure or building composition all requiring similar treatment/service. However, the researchers consider these limitations negligible due to the relative similarity of the subject site to the comparative site, and their methodology provides anecdotal evidence for which alternative is most cost effective. In the last alternative, adding additional civil service personnel to the existing in-house support structure, the researchers simply considered the calculated costs determined in *Status Quo* and

increased that total by the labor costs for the additional personnel. In this case, the researchers considered the additional administrative costs associated with space requirements, IT services, and so forth, negligible as excess capacity with respect to these administrative elements already existed in the current in-house operation.

## 2. Analysis

### ***a. Status Quo – Calculate Actual Cost Data for Current JBAB In-House Pest Management Operations***

In calculating this alternative, the researchers used two elements: labor costs for JBAB in-house employees based on the labor data available and the cost of chemicals applied during this same period. Due to limited available data, the researchers assumed that, based on input from the JBAB Facilities Division personnel, costs for maintenance of vehicles and equipment used in support of pest management operations, as well as facilities used to house the pest management operation, were negligible and were already included as a fractional element of the larger JBAB NAVFAC Facilities Division. The vehicles assigned to the pest management operation belong to the larger NAVFAC vehicle pool and would be placed back into that pool should the determination be made to outsource pest management and therefore the cost was not calculated. To determine labor costs, the researchers used labor statistics for the in-house entomologists (see Table 5) and materials costs (see Table 8) that included summary statistics, as seen in Table 9.

|                        | <b>Avg. Monthly</b> | <b>Annual Labor Costs</b> |
|------------------------|---------------------|---------------------------|
| <b>Labor Costs</b>     | \$25,310.66         | \$303,727.92              |
| <b>Materials Costs</b> | \$20,697.83         | \$248,373.91              |
| <b>Total Costs</b>     | \$46,008.49         | <b>\$552,101.83</b>       |

**Table 10. Total Annual Costs for In-House Pest Management Operations**

The total estimated annual costs, based on the available data for in-house pest management services, are \$552,101. A comparison of this calculated annual total to the contract prices returned on the pest management services for Naval District Washington's regional contract found that this total is reasonable (see Table 6). When "thinking on the margin," the calculated cost for JBAB current in-house pest management operation of \$552,101 is the cost of what is currently being done; therefore, any alternative that costs greater than this is considered to exceed the margin (Mankiw, 2006).

***b. Outsource All – Outsource Entire JBAB Pest Management Function to a Private Contractor***

To determine what the cost structure may look like if the entire pest management operation on JBAB were outsourced, the researchers analyzed the existing regional IDIQ pest management contract (see Appendix D). This contract serves the area in which JBAB is located and was awarded on May 14, 2009. It contains a base period and four option periods. The contract contains four contract line item numbers (CLINs). Each of the first three CLINs contain an FFP amount for a specified group of buildings and acreage as listed in attachment J of the contract. CLINs 1001 through 6001 of the contract contain IDIQ services, which can be ordered up to a ceiling amount independent of any other CLIN.

The researchers analyzed this awarded contract to project the current market cost of a pest management operation that a private contractor performed. They then projected the cost for JBAB based on number of acres and buildings to estimate the amount it would cost to outsource the entire pest management function to a private contractor.

The contract is summarized by the following four CLINs:

- PWD Washington
- PWD North Potomac
- PWD South Potomac
- IDIQ Services

The researchers selected the PWD Washington CLIN because it contained the majority of buildings, with nearly 94% of all the square footage to be treated in the current schedule; additionally, it contained a moderate amount of acreage to be treated. It also had the best mix of building types and locations throughout the area (including the two buildings on Anacostia, as previously stated in Chapter I, marine barracks buildings, and administrative office space). The PWD North Potomac and PWD South Potomac CLINs contain about 6% of the total contract square footage to be treated and was mostly rural, uninhabited acreage. For the purposes of acreage, this contract calls for the surveillance of adult mosquitoes in the acreage specified. A fogging machine is used to conduct the primary means of mosquito surveillance at specific times of the year and is not considered a significant cost driver in this analysis due to the infrequency of treatment and relatively low cost of materials. For the purposes of this analysis, the researchers consider the buildings and the square footage inside those buildings to be the significant cost drivers of pest treatment based on costs found in the contract. Therefore, the researchers compute and use the cost as a function of the number of buildings treated in the PWD Washington CLIN to project the cost of treating the buildings on JBAB.

| PWD Washington Portion of Contract (Only) |                           |                        |                     |
|---|---------------------------|------------------------|---------------------|
| Base Period                               | 14 May 2009 - 13 May 2010 |                        |                     |
| (A) Firm Fixed Price (FFP)                | IDIQ Services (all)       | (B) PWD's 18 buildings | TOTAL (A + B)       |
| \$129,449.80                              | \$206,640.25              | \$112,712.86           | <b>\$242,162.66</b> |

**Table 11. PWD Washington Contract**

Table 11 depicts the contract cost for PWD Washington. It summarizes the costs of the base period for both the FFP and IDIQ portion of the contract. The PWD Washington CLIN contains 18 of the 33 buildings included in the original contract prior to Bolling and Anacostia bases becoming a joint base, and are listed throughout the contract. The researchers used this ratio to calculate the PWD's IDIQ portion of

estimated costs. The table summarizes the base period cost for FFP scheduled services of \$129,449.80 and adds \$112,712.86, which is the PWD's portion of IDIQ services to be ordered during the base period.

To determine the cost per building, the researchers divided the total of \$242,162.66 by the 18 buildings that make up the PWD CLIN. The cost per building for PWD Washington was \$13,453.48, as shown in Table 12.

| <b>PWD Washington Portion of Contract (Only) - Cost per building</b> |                                  |               |                                |
|--|----------------------------------|---------------|--------------------------------|
| <b>Base Period</b>   | <b>14 May 2009 - 13 May 2010</b> |               |                                |
| (A) Firm Fixed Price (FFP)   | (B) PWD's 18 buildings           | TOTAL (A + B) | Cost per building (Total / 18) |
| \$129,449.80   | \$112,712.86                     | \$242,162.66  | <b>\$13,453.48</b>             |

**Table 12. PWD Washington Cost per Building**

To estimate what the base year would have cost if all of JBAB had been outsourced to a private contractor, the researchers multiplied the cost per building (\$13,453.48) as calculated in the previous table, by the total buildings (210 buildings), which now make up the scope of work for all of JBAB. In using buildings as the basis for determining costs, the researchers considered average square footage of all buildings and verified the requirement for similar service in all buildings with subject matter experts. The average building square footage of buildings at PWD Washington was consistent with the average square footage for buildings at JBAB. The resulting base year estimate based on buildings was determined to be \$2,825,231.08. The summary of this data is provided in Table 13.

| JBAB             |                              |             |                 |                           |
|------------------|------------------------------|-------------|-----------------|---------------------------|
| N40080-09-D-0474 | Period of Performance        | TOTAL       | Total Buildings | Projected Contract Cost   |
| Base Period      | 14 May 2009 -<br>13 May 2010 | \$13,453.48 | 210             | \$<br><b>2,825,231.08</b> |

**Table 13. JBAB Projected Outsource Costs**

At first glance, the researchers experienced sticker shock. Is it possible the pest treatment requirement could cost \$2.825 million per year on JBAB? Did the researchers miss something or exclude vital information? In order to gain confidence in this narrow method, the researchers tested actual numbers. Eleven task orders were issued against the regional IDIQ for PWD Washington during the base year for a total cost of \$140,095.24. Task Order 1 of the IDIQ contract was not provided, therefore unable to be included in this test. If \$140,095.24 is the only cost for pest services at PWD Washington for the base period, and that number is once again applied to cost as a function of buildings treated (\$140,095.24/18). The cost per building would then be \$7,783.07. The cost per building of \$7,783.07 x 210 buildings to be treated on JBAB equal \$1,634,444.23. Therefore, based on actual cost obligated in Task Orders 2 through 11 of the IDIQ contract and the researchers calculated estimate in Table 14, the cost to outsource all of JBAB to a private contractor is between \$1,634,000 and \$2,825,000.

*c. Hybrid Support – Utilize In-House Personnel and IDIQ Services for JBAB Pest Management Operation*

The cost of \$581,644 for three in-house employees, as computed in Table 2, and the cost range of \$1,634,444.23 – \$2,825,231.08 estimated to outsource the entire requirement to a private contractor, using the low end of that range, would allow up to \$1,052,799.40 in pest services to be ordered from an IDIQ contract vehicle.

*d. Expand In-House – Hire Additional Civil Service Personnel to Augment Current Workforce*

Based on calculations from *Status Quo*, the researchers determined the total estimated annual costs for the in-house pest management operations at JBAB to be

\$581,644 (see Table 10). Under this alternative (*Expand In-House*), the researchers needed to determine the total costs if an additional in-house employee were added to the workforce. To calculate costs for this alternative, the researchers once again used the labor costs from Table 10 of \$25,310 per month for three in-house employees at JBAB. Based on this monthly amount, they determined the costs of a single in-house employee to be \$8,437 per month (\$25,310/3). Table 14 shows the total costs under *Expand In-House*.

|  | <b>Avg. Monthly</b> | <b>Annual Labor Costs</b> |
|--|---------------------|---------------------------|
| <b>Labor Costs (current in-house personnel):</b> | \$25,310.66         | \$303,727.92              |
| <b>Labor Costs (one additional FTE):</b>         | \$8,436.67          | \$101,240.00              |
| <b>Materials Costs:</b>                          | \$20,697.83         | \$248,373.91              |
| <b>Total Costs:</b>                              | \$54,445.16         | <b>\$653,341.83</b>       |

**Table 14. Total Annual Costs for In-House Pest Management Operations with One New Hire**

Based on the calculations in Table 14, the total annual costs to retain the current in-house pest management workforce of three in-house employees and to hire one additional employee at the same pay grade is \$653,341. Of note, in this calculation the researchers used an average monthly salary for the additional employee as well as the three current employees. They used the average monthly salary because it was based on labor costs for the three current employees, who all carry the same pay grade (see Appendix F). The researchers based the calculation in Table 14, which was related to labor costs of an additional employee, on an assumption that hiring any additional employees would also be at this same pay grade. With a better understanding of the capability requirements of any additional entomologists to the JBAB in-house workforce,

JBAB Facilities Division leadership could determine to hire at or below this level, possibly resulting in lower overall operational costs. When hiring an additional employee, it may imply a proportional increase in materials is needed to complete the increased workload. The researchers considered this nominal and did not calculate an increase for this item.

## B. PRELIMINARY FINDINGS

### 1. Primary Research Question

- a. What would it cost to outsource the entire pest and herbicide treatment function on JBAB to a private contractor? The researchers estimated this cost to be between \$1.634 million and \$2.825 million.

|       |                 |                        |
|-------|-----------------|------------------------|
| COA 1 | Status Quo      | \$552,101 <sup>a</sup> |
| COA 2 | Outsource All   | \$1.634M <sup>b</sup>  |
| COA 3 | Hybrid Support  | \$1.082M <sup>c</sup>  |
| COA 4 | Expand In-House | \$101,240 <sup>d</sup> |

<sup>a</sup> current in-house estimated costs  
<sup>b</sup> low end of estimated cost  
<sup>c</sup> COA 2 - COA 1 (\$1.634M - \$552,101 = \$1.082M)  
<sup>d</sup> incremental increase to Status Quo (COA 1)

**Table 15. Preliminary Cost Benefit Analysis Table for Alternatives 1–4**

## 2. Qualitative Analysis (Secondary Research Questions)

### a. *What are the Advantages and Disadvantages to Keeping the Current Pest and Herbicide Treatment Function on JBAB In-House (Status Quo)?*

The researchers have identified seven advantages of keeping the current pest and herbicide treatment requirement on JBAB in-house.

- Three in-house employees have proven capable of meeting the increased workload requirement since June 1, 2011, with no noted increase in response times.
- Incoming trouble calls and maintenance backlogs may help determine whether the current in-house personnel would continue to be able to meet the increased workload requirement.
- Emergency, unexpected, or large-scale pest treatment work orders requiring temporary additional manpower can be met by IDIQ task-order services.
- Economies of scale and re-work is minimized by the current organizational chart, which allows pest services to draw construction and maintenance and to repair support to permanently repair building damage caused by rodents and other pests.
- Preventative and proactive pest services are conducted daily.
- Heavy work orders in summer months suggest the current staff can meet the most demanding time of the year.
- In-house personnel are certified to apply both pest and herbicide treatments, which meet all the requirements of the pest services contract and some of the requirements in the ground maintenance functional assessment plan (see Appendix G).

The researchers have identified two disadvantages of keeping the current pest and herbicide treatment requirement on JBAB in-house.

- Limited historical pest treatment records or trouble call logs provide information to properly assess whether the increased building and acreage requirement can be met by three in-house employees.
- Current standard operating procedure does not reflect a pest management support standard for joint bases and does not contain a sourcing strategy or manpower mix to meet those standards.

**b. *What are the Advantages and Disadvantages to Outsourcing the Entire Pest and Herbicide Treatment Function on JBAB to a Private Contractor (Outsource All)?***

The researchers have identified four advantages of outsourcing the entire pest and herbicide treatment function on JBAB.

- Existing regional IDIQ contract can be re-competed to include a 736 percent increased building requirement (a current 33 building requirement will become a 243 building requirement) and a 285 percent increased acreage requirement (a current 523 acre requirement will become a 1,489 acre requirement) on JBAB. Competition and economies of scale may drive performance costs lower across all installations in this region.
- Contract administration functions can be easily absorbed into existing business office.
- A good supply of well-trained vendors is available to provide pest services and offer competition in the procurement process.
- Outsourcing conforms to and is aligned with current DoD policy allowing private sector performance of non-vital government functions.

The researchers have identified three disadvantages of outsourcing the entire pest and herbicide treatment function on JBAB:

- Prior to the base merger, only two of the 74 buildings located on NSF Anacostia were included in the existing regional IDIQ contract. The 136 buildings on Bolling AFB have never been on contract for pest and herbicide services. The current regional contract scope is for a total of 33 buildings. The requirement for pest services would increase from 33 to 243 buildings; therefore, costs of performance are expected to grow in proportion.
- The long-term installation support function of pest management services would be outsourced, limiting or reducing the government's technical competence and flexibility with current in-house personnel.
- Weed control has been deleted from the pest services contract and awarded under a separate grounds maintenance contract; therefore, additional costs exist for weed control that are not included in this analysis.

*c. What are the Advantages and Disadvantages of Implementing a Multiworkforce Human Capital Strategy as Defined by the GAO on JBAB (Hybrid Support)?*

The researchers have identified four advantages of supporting a multi-workforce human capital strategy for pest management on JBAB.

- In Appendix I of the GAO's 2010 report, the GAO describes the following: A "situation when in-sourcing may be justified without a full-cost analysis: to establish control or build capacity or maintain control of an agency's mission and operations" (p.13). The technical competence and institutional knowledge already employed to meet the pest management standard for mission support on JBAB has already been in-sourced.
- Any excess capacity of existing in-house personnel would be efficiently utilized to meet the increased pest management requirement on JBAB.
- If the increased requirement is determined as not being met, pest management services could be ordered to meet the shortfall. The GAO's (2010) guidelines in Appendix I state that "if a preliminary analysis suggests that public-sector performance is more cost-effective, . . . initiate a more detailed analysis for in-sourcing options"(p.13) Utilizing current in-house employees and the right contractor mix for shortfalls would support both a cost-effective and balanced workforce, as the GAO suggested.
- A balanced work force mix may already be in place. The larger requirement and long term installation functional standard of pest management services for JBAB is being met since June 1, 2011 by in-house personnel. By shifting the weed control requirement from in-house personnel to a grounds maintenance contract, greater in-house capacity can be gained. Plus, technical expertise for weed control will continue to exist from in-house personnel, who can be consulted as needed for oversight of the weed control portion of the grounds maintenance contract.

The researchers have identified one disadvantage of supporting a multi-workforce human capital strategy for pest management on JBAB.

- Continuity of leadership and management would be required to ensure regular review of the chosen alternative. Monitoring the current alternative and workforce mix would reduce the chances of unforeseen cost growth and performance shortfalls. Changes to the workforce mix would be required as the breadth of the JBAB pest and herbicide treatment requirement becomes better defined over time.

*d. What are the Risks?*

Overall, the risk to JBAB is inadequate, insufficient, or ineffective pest management services, which would disrupt base operations, disturb or injure occupants, or realize cost inefficiencies. Moreover, inconsistent goals for pest management services onboard JBAB exist and need to be better defined and aligned with emerging policy suggestions and guidelines. Prior to the merger of Anacostia and Bolling, levels of service were different. Bolling in-house personnel have responded to pest infestations on Anacostia in the past, which lend support to an inconsistent requirement in the existing regional pest management contract. The greatest risk to outsourcing the entire pest management function as it relates to costs may be two-fold: (1) the increase in scope as it relates to quantity of buildings requiring treatment will require a re-solicitation, and (2) if the decision is made to outsource, further costs will be incurred to conduct additional analysis for in-house employee terminations.

The real risk may be a decision made without analysis. A study of the lack of historical information in performing pest management on the new joint base of JBAB has never been done before; however, the capability fortunately exists, both in-house and in the private sector, to perform this mission. Future researchers should analyze cost, performance, and capacity of what is already being done in the short term to mitigate this risk in the long term.

THIS PAGE INTENTIONALLY LEFT BLANK

## **V. CONCLUSION**

### **A. SUMMARY**

The objective of this research was to provide guidance on the decision to outsource, insource, or have a hybrid of the two. While the report is specific to the base function of pest management, the researchers would have liked to generalize the results to any installation facing a similar decision. However, the scope of the data only allowed them to focus on a single installation. The researchers defined four alternatives and provided analysis on each in order to enable the decision-maker on JBAB to make the best informed decision in meeting the pest management requirement on JBAB. The researchers selected the existing and forthcoming policy documents discussed in Chapter II to empower the decision-maker with the knowledge of how to better implement a workforce to meet an immature requirement. The researchers chose the data collected and presented in Chapter III to explain how pest management is currently being done on JBAB and what costs are associated with that data. The last two chapters discussed the methodology and analysis of the data. The researchers close this project with recommendations for further analysis.

## B. RESULTS

### 1. Final Alternative Analysis Based on Combined Quantitative and Qualitative Factors

| Quantitative Analysis Results |                 |                        | Qualitative Analysis Results |               |
|-------------------------------|-----------------|------------------------|------------------------------|---------------|
|                               | DECISION        | COST                   | Advantages                   | Disadvantages |
| COA 1                         | Status Quo      | \$552,101 <sup>a</sup> | 7                            | 2             |
| COA 2                         | Outsource All   | \$1.634M <sup>b</sup>  | 4                            | 3             |
| COA 3                         | Hybrid Support  | \$1.082M <sup>c</sup>  | 4                            | 1             |
| COA 4                         | Expand In-House | \$101,240 <sup>d</sup> | 1                            | 1             |

<sup>a</sup> current in-house estimated costs  
<sup>b</sup> low end of estimated cost  
<sup>c</sup> COA 2 - COA 1 (\$1.634M - \$552,101 = \$1.082M)  
<sup>d</sup> incremental increase to Status Quo (COA 1)

\* it is assumed no considerable qualitative advantage or disadvantage exists

**Table 16. Final Cost Benefit Analysis Table**

Based on the research and analysis conducted in this project, the researchers believe the best alternative for JBAB to complete the pest management mission is to select the *Status Quo* alternative. The *Status Quo* alternative represents the lowest cost alternative compared to the other three. Additionally, the current manning under *Status Quo*, to include three entomologists and support equipment, has proven capable of meeting the current service demand on JBAB during the months with the greatest workload (e.g., spring and summer months) with no significant increase in the backlog of work orders. Until the backlog of work orders increases beyond the capability of current JBAB pest management manning, the *Status Quo* alternative will remain the best alternative.

### 2. Recommendations for Further Analysis

The following analysis may prove beneficial in supporting completion of the pest control mission or other missions on JBAB, particularly with respect to installation support functions on joint bases.

- No budget was formulated or allocated specifically to pest control; therefore, real costs for in-house operations could not be definitively coded or catalogued. JBAB could take the lead on aligning budget criteria with the 47 installation functions that the GAO has already suggested.
- The researchers of this project uncovered an in-house capability on JBAB that is also being served by a private contractor. In-house entomologists are certified in pesticide and herbicide treatment and have the technical ability to complete the weed control mission on JBAB. Research could be conducted to identify other in-house capabilities that exist on JBAB and investigate whether a private contractor would duplicate those efforts when the capacity exists to complete the requirement in-house.
- The researchers identified multiple advantages and disadvantages to each alternative. Further qualitative analysis could be conducted by the command to properly weight each alternative to form a more decisive conclusion for each alternative (course of action).

THIS PAGE INTENTIONALLY LEFT BLANK

## APPENDIX A. NAVAL DISTRICT WASHINGTON REGIONAL PEST MANAGEMENT CONTRACT



**N40080-09-D-0474  
REGIONAL PEST CONTROL SERVICES  
AT NAVAL DISTRICT WASHINGTON**

### **SECTION B BID SCHEDULES AND ATTACHMENT 0200000-08 ELINs EXHIBITS**

The attached schedules utilize *Microsoft Excel 2007*. Mathematic formulae are built-in and cannot be altered.

The Offeror is to fill in all attached Exhibits A through K (ExA through ExK) with unit prices.

Data can be entered only in the ELIN "Unit Price" cells of the Exhibits Worksheets "ExA" through "ExK" and calculations will be done automatically.

Spread sheets "Intro," "Totals," "Base," "Opt.1," "Opt.2," "Opt.3," "Opt.4" and "Opt.5" are protected and cannot be altered.

Data will automatically be transferred to the appropriate CLIN and SLIN in Section B - Supplies or Services and Prices/Costs.

**DO NOT ENTER FORMULAE IN CELLS. DO NOT ENTER LINKS IN CELLS. ENTER NUMBERS ONLY**

Proposals are solicited on an "all or none" basis. Failure to submit costs for all items will be cause for rejection of the proposal.

Submit five (5) printed copies of this workbook, along with this electronic workbook, with your price proposal.

**FACILITY SUPPORT CONTRACTS - Naval District Washington  
INNOVATION - LEADERSHIP - PERFORMANCE**

N40080-09-D-0474  
REGIONAL PEST CONTROL SERVICES  
AT NAVAL DISTRICT WASHINGTON

|                            | Firm<br>Fixed-Price | Indefinite<br>Quantity | Totals          |
|----------------------------|---------------------|------------------------|-----------------|
| Contract Base Period       | \$ 255,170.54       | \$ 206,640.25          | \$ 461,810.79   |
| 1st Contract Option Period | \$ 268,592.28       | \$ 352,931.63          | \$ 621,523.91   |
| 2nd Contract Option Period | \$ 282,737.84       | \$ 365,388.78          | \$ 648,126.62   |
| 3rd Contract Option Period | \$ 297,623.50       | \$ 378,483.15          | \$ 676,106.65   |
| 4th Contract Option Period | \$ 313,292.36       | \$ 392,223.88          | \$ 705,516.24   |
| Total                      | \$ 1,417,416.52     | \$ 1,695,667.69        | \$ 3,113,084.21 |



FACILITY SUPPORT CONTRACTS - Naval District Washington  
INNOVATION - LEADERSHIP - PERFORMANCE

## APPENDIX B. BOLLING AIR FORCE BASE STANDARD OPERATING PROCEDURES

### ***PEST MANAGEMENT PLAN*** ***Bolling Air Force Base, D.C.***

*Prepared for*



**11 CES/CEV  
370 Brookley Avenue  
Bolling AFB, D.C. 20032**

**Sept 2008-2009**

*Prepared by*

**PARSONS**

**100 WEST WALNUT STREET • PASADENA • CALIFORNIA 91124**



## TABLE OF CONTENTS

|  |      |
|--|------|
| ACRONYMS AND ABBREVIATIONS   | v    |
| APPROVAL AND TECHNICAL REVIEW (SIGNATURES)   | vi   |
| RECORD OF REVIEWS  | vii  |
| EXECUTIVE SUMMARY  | viii |
| INSTALLATION IMPLEMENTATION AUTHORITY  | ix   |
| <b>1.0 INTRODUCTION</b>  | 1    |
| 1.1 Objectives of the Pest Management Plan   | 1    |
| 1.2 Installation Description and Mission   | 2    |
| 1.3 Responsibilities For Conduct Of The Pest Management Program                                      | 3    |
| 1.3.1 Wing Commander, 11 <sup>th</sup> WG/CC   | 3    |
| 1.3.2 Base Civil Engineer, 11 <sup>th</sup> CES/CC   | 3    |
| 1.3.3 Entomology Shop Supervisor, 11 <sup>th</sup> CES/CEOHE   | 4    |
| 1.3.4 Entomology Shop Personnel, 11 <sup>th</sup> CES/CEOHE  | 4    |
| 1.3.5 Environmental Flight, 11 <sup>th</sup> CES/CEV   | 5    |
| 1.3.6 Public Health Office   | 5    |
| 1.3.7 Environmental Engineering  | 6    |
| 1.3.8 Building Occupants   | 6    |
| <b>2.0 PEST MANAGEMENT REQUIREMENTS AND STRATEGIES FOR APPLICABLE PEST/DISEASE VECTOR CATEGORIES</b> | 7    |
| 2.1 Disease Vectors and Other Health-Related Pests   | 7    |
| 2.2 General Household and Nuisance Pests   | 8    |
| 2.3 Structural Pests   | 9    |
| 2.4 Weed Control   | 10   |
| 2.5 Stored Products Pests  | 10   |
| 2.6 Pests of Ornamental Plants and Turf  | 11   |
| 2.7 Pests of Natural Resources   | 11   |
| 2.8 Miscellaneous Pests  | 11   |
| 2.9 Vertebrate Pests   | 12   |
| 2.10 Other Categories  | 12   |
| <b>3.0 ADMINISTRATION</b>  | 13   |
| 3.1 Job Orders   | 13   |
| 3.2 Contracts  | 13   |
| 3.3 Inter-Service Support Agreements   | 13   |
| 3.3.1 Self-Help Program  | 13   |
| 3.3.2 Contingency Responsibilities   | 14   |
| 3.4 Outleases  | 14   |

**Pest Management Plan  
Bolling AFB, D.C.**

|       |   |    |
|-------|---|----|
| 3.5   | Resources (Current and Proposed)  | 14 |
| 3.5.1 | Funding   | 14 |
| 3.5.2 | Staffing  | 15 |
| 3.5.3 | Materials (Pesticides, Equipment, Supplies, Etc.)   | 15 |
| 3.5.4 | Facilities  | 16 |
| 3.6   | Reports and Records   | 16 |
| 3.7   | Training Plans  | 16 |
| 3.8   | Coordination with Food Service Managers, Maintenance Personnel, etc.  | 17 |
| 3.9   | Termite Inspection Plan   | 17 |
| 4.0   | HEALTH AND SAFETY MEASURES  | 18 |
| 4.1   | Requirements  | 18 |
| 4.2   | Methods to Reduce Potential Hazards   | 18 |
| 4.2.1 | Entomology Shop Personnel   | 18 |
| 4.2.2 | Installation Personnel (including Military Family Housing Residents)  | 19 |
| 4.2.3 | Public  | 19 |
| 4.3   | Safety and Health Measures Associated with the Pest Management/Control Shop                                       | 19 |
| 4.4   | Safety and Health Measures Associated with Pest Management Vehicles   | 19 |
| 5.0   | PUBLIC LAWS AND REGULATIONS   | 20 |
| 6.0   | COORDINATION WITH OTHER ORGANIZATIONS AND AGENCIES  | 21 |
| 7.0   | MEASURES FOR COMPLIANCE WITH MEMORANDUM OF UNDERSTANDING WITH U.S. EPA WITH RESPECT TO INTEGRATED PEST MANAGEMENT | 22 |
| 8.0   | PEST MANAGEMENT OPERATIONS WITH SPECIAL ENVIRONMENTAL CONSIDERATIONS  | 23 |
| 8.1   | Operations Using Restricted Use Pesticides  | 23 |
| 8.2   | Operations With Potential to Contaminate Surface or Groundwater   | 23 |
| 8.3   | Operations Involving More Than 640 Acres  | 23 |
| 8.4   | Operations In Areas with Endangered or Protected Species  | 23 |
| 8.5   | Operations Involving Aerial Application   | 25 |
| 8.6   | Operations Involving Designated Noxious Weeds   | 25 |
| 8.7   | Operations Involving Experimental-Use Permits   | 25 |
| 8.8   | Operations Involving Environmentally Sensitive Areas  | 25 |
| 9.0   | OTHER PEST MANAGEMENT PLAN ISSUES   | 27 |
| 9.1   | Applicable Pollution Control Projects   | 27 |
| 9.2   | Applicable Pollution Abatement Procedures   | 27 |
| 9.3   | Pesticides Sold in Commissaries and Exchanges   | 27 |

*Pest Management Plan  
Bolling AFB, D.C.*

|      |  |    |
|------|--|----|
| 10.0 | PEST MANAGEMENT PLAN FOR SERVICES PROVIDED TO OTHER<br>ACTIVITIES OR INSTALLATIONS ..... | 28 |
| 10.1 | On Installation .....  | 28 |
| 10.2 | Off Installation .....   | 28 |

**LIST OF ANNEXES**

|         |  |
|---------|--|
| Annex A | Installation Map   |
| Annex B | Annual Pesticide Procurement Approval from the Cognizant Component Pest Management Consultant Prior to Procurement of Pesticides |
| Annex C | Pesticide Inventory Including Pesticide Name, Manufacturer, Unit of Issue, Concentration, Quantity, National Stock Number        |
| Annex D | Pesticide Labels, Material Safety Data Sheets, and Consumer Protection Information Sheets for Preservative Treated Wood Products |
| Annex E | Operational Control and Maintenance Records from Previous Years  |
| Annex F | Applicable Instructions and Procedures   |
| Annex G | Contracting Standards, Specifications and Statements of Work   |
| Annex H | Manpower Surveys   |
| Annex I | Shop Equipment and Sources   |
| Annex J | List of Safety Items and Personal Protective Equipment   |
| Annex K | Technical Information  |
| Annex L | Spill Plan and Pesticide Clean Up Guidance   |
| Annex M | Industrial Hygiene Surveys of Pest Management Shop   |
| Annex N | Cost Comparison Analysis   |
| Annex O | West Nile Virus Response Plan  |

**ACRONYMS AND ABBREVIATIONS**

|        |  |
|--------|--|
| AAFES  | Army and Air Force Exchange Service                        |
| AFB    | Air Force Base   |
| AFCESA | Air Force Civil Engineer Support Agency                    |
| AFI    | Air Force Instruction                                      |
| AFMAN  | Air Force Manual   |
| AFOSH  | Air Force Occupational Safety and Health                   |
| AFPMB  | Armed Forces Pest Management Board                         |
| DIAC   | Defense Intelligence Agency Center                         |
| DoDI   | Department of Defense Instruction                          |
| DRMO   | Defense Reutilization and Marketing Office                 |
| ECAMP  | Environmental Compliance Assessment and Management Program |
| FAR    | Federal Acquisition Regulations                            |
| FIFRA  | Federal Insecticide, Fungicide and Rodenticide Act         |
| HAZCOM | Hazard Communication                                       |
| HQ     | Headquarters   |
| INRMP  | Integrated Natural Resource Management Plan                |
| IPM    | Integrated Pest Management                                 |
| IPMIS  | Integrated Pest Management Information System              |
| MFH    | Military Family Housing                                    |
| MSDS   | Material Safety Data Sheet                                 |
| NWI    | National Wetlands Inventory                                |
| PCS    | Permanent Change of Status                                 |
| PMP    | Pest Management Plan                                       |
| PPE    | Personal Protective Equipment                              |
| QAE    | Quality Assurance Evaluator                                |
| RWP    | Recurring Work Program                                     |
| SOW    | Statement of Work  |
| TIM    | Technical Information Memorandum                           |
| ULV    | Ultra Low Volume   |
| USAF   | US Air Force   |
| USEPA  | US Environmental Protection Agency                         |
| USFWS  | US Fish and Wildlife Service                               |
| WIMS   | Work Information Management System                         |
| WNV    | West Nile Virus  |

*Pest Management Plan  
Bolling AFB, D.C.*

APPROVAL AND TECHNICAL REVIEW (SIGNATURES)

[Signature]  
Installation Pest Manager

Date

[Signature]  
Commander 11th Civil Engineer Squadron

Date

[Signature]  
Bioenvironmental Engineering Flight Commander

Date

[Signature]  
Public Health Flight Commander

Date

[Signature] /CEOA  
Component Pest Management Consultant

Date

*Pest Management Plan  
Bolling AFB, D.C.*

**RECORD OF REVIEWS**

| Annual Reviews |                     |
|----------------|---------------------|
| Date           | Review Conducted by |
|                |                     |
|                |                     |
|                |                     |
|                |                     |
|                |                     |

| On-Site Reviews |                     |
|-----------------|---------------------|
| Date            | Review Conducted by |
|                 |                     |
|                 |                     |
|                 |                     |
|                 |                     |
|                 |                     |

#### **EXECUTIVE SUMMARY**

The Pest Management Plan for Bolling Air Force Base (AFB) describes the installation's integrated pest management (IPM) program, defines the requirements for the program, outlines the necessary resources for surveillance and control, and identifies the administrative, safety, and environmental requirements of the program. Pests covered by the plan include weeds and unwanted vegetation, termites, mosquitoes, crawling insects (ants, crickets, cockroaches, etc.) and mice, raccoons, and other vertebrate pests, which, if uncontrolled, could interfere with the military mission, damage real property, increase maintenance costs, and expose installation personnel to diseases.

The IPM program's goal is to reduce the use of pesticides that may present a hazard to humans and the environment by combining biological, chemical, cultural and physical control practices to manage pest populations. The implementation of the IPM program includes monitoring, surveillance, service control efforts, as well as public relations and education. This program requires cooperation among various cognizant base organizations such as the Public Health Office, Safety Office, Environmental Flight, and coordination with Bioenvironmental Engineering Flight.

The Bolling AFB IPM program has met the three measures of merit: to have a written pest management plan, reduce pesticide use by 50% by the year 2000, and to have certified pesticide applicators. This pest management plan was first issued in 1999 and has been reviewed annually. Pesticide use has been reduced by 93% from the baseline year of 1993. All Entomology Shop personnel are certified through the Air Force Civil Engineer Support Agency (AFCESA) and attend continuing education as required by the District of Columbia.

The pest management plan also identifies environmental management programs and issues that pesticide use may affect. These include hazardous materials and hazardous waste management, storm water management, contingency and response planning, and others.

Finally, the pest management plan identifies the on- and off-installation facilities that are covered by this plan.

*Pest Management Plan  
Bolling AFB, D.C.*

---

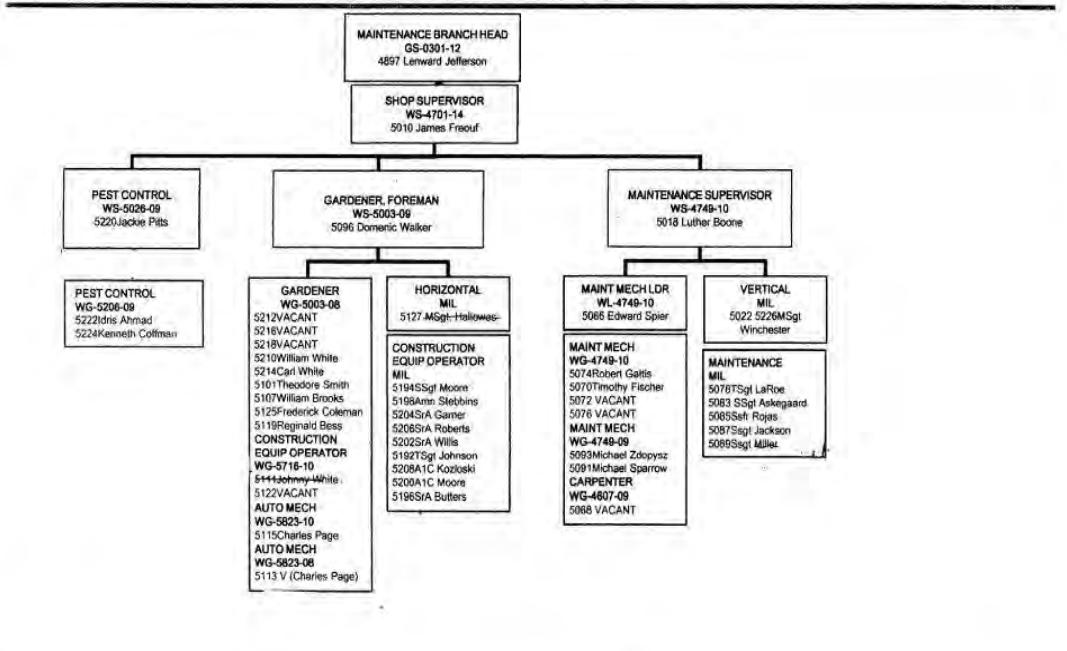
**INSTALLATION IMPLEMENTATION AUTHORITY**

Air Force Instruction (AFI) 32-1053, *Pest Management Program*, 1 April 1999

Department of Defense Instruction (DoDI) 4150.07, *DoD Pest Management Program*, 29 May 2008

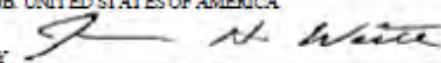
## APPENDIX C. JOINT BASE ANACOSTIA-BOLLING ORGANIZATIONAL CHART

### JBAB - Maintenance



THIS PAGE INTENTIONALLY LEFT BLANK

## APPENDIX D. OUTSOURCED CONTRACT TO MARATHON INC.

|  |  |  |   |  |  |                        |
|--|--|--|---|--|--|------------------------|
| AWARD/CONTRACT   |  | 1. THIS CONTRACT IS A RATED ORDER<br>UNDER DPAS (15 CFR 350)   |   |  | RATING   | PAGE OF PAGES<br>1 194 |
| 2. CONTRACT (Proc. Inc. Ident. NO.<br>N40080-09-D-0474)  |  | 3. EFFECTIVE DATE<br>14 May 2009   |   | 4. REQUISITION/PURCHASE REQUEST/PROJECT NO.<br>AC0108040   |  |                        |
| 5. ISSUED BY<br>NAVAL FACILITIES ENG COMMAND WASHINGTON<br>1314 HARWOOD ST, BLDG 212<br>WASHINGTON DC 20374  |  | CODE N40080  |   | 6. ADMINISTERED BY<br>(If other than Item 5) CODE<br><br>See Item 5  |  |                        |
| 7. NAME AND ADDRESS OF CONTRACTOR<br>MARATHON INC<br>NAYA POWELL<br>30 BELMONT DR<br>ATLANTA GA 30311-2774   |  |  |   |  | 8. DELIVERY<br>[ ] FOB ORIGIN [ X ] OTHER (See Below)  |                        |
|  |  |  |   |  | 9. DISCOUNT FOR PROMPT PAYMENT   |                        |
| CODE 3E7Y8   |  | FACILITY CODE  |   |  | 10. SUBMIT INVOICES<br>(If copies must be sent to other than specified)<br>TO THE ADDRESS<br>SHOWN IN: | ITEM<br>Block 5        |
| 11. SHIP TO/MARK FOR   |  | CODE   |   | 12. PAYMENT WILL BE MADE BY<br>DPAS-CLEVELAND, NORFOLK ACCTS PAYABLE<br>P.O. BOX 58622<br>CLEVELAND OH 44199 |  |                        |
|  |  | See Schedule   |   |  |  |                        |
| 13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN<br>COMPETITION:<br>[ ] 10 U.S.C. 2304(c)( ) [ ] 41 U.S.C. 253(c)( )   |  | 14. ACCOUNTING AND APPROPRIATION DATA  |   |  |  |                        |
| 15A. ITEM NO.  | 15B. SUPPLIES SERVICES                 |  | 15C. QUANTITY   | 15D. UNIT  | 15E. UNIT PRICE  | 15F. AMOUNT            |
|  | SEE SCHEDULE                           |  |   |  |  |                        |
| 15G. TOTAL AMOUNT OF CONTRACT  |  |  |   |  |  | \$461,810.73           |
| 16. TABLE OF CONTENTS  |  |  |   |  |  |                        |
| (X) SEC.   | DESCRIPTION                            | PAGE(S)  | (X) SEC.  | DESCRIPTION  | PAGE(S)  |                        |
| PART I - THE SCHEDULE  |  |  |   |  |  |                        |
| X A  | SOLICITATION CONTRACT FORM             | 1  | X I   | CONTRACT CLAUSES   | 64 - 77  |                        |
| X B  | SUPPLIES OR SERVICES AND PRICES/ COSTS | 2 - 13   | PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS  |  |  |                        |
| X C  | DESCRIPTION/ SPECS/ WORK STATEMENT     | 14 - 46  | X J   | LIST OF ATTACHMENTS  | 78 - 194   |                        |
| X D  | PACKAGING AND MARKING                  |  | PART IV - REPRESENTATIONS AND INSTRUCTIONS                    |  |  |                        |
| X E  | INSPECTION AND ACCEPTANCE              | 47 - 50  | K   | REPRESENTATIONS, CERTIFICATIONS AND<br>OTHER STATEMENTS OF OFFERORS  |  |                        |
| X F  | DELIVERIES OR PERFORMANCE              | 51 - 58  | L   | INSTR. CONDS. AND NOTICES TO OFFERORS  |  |                        |
| X G  | CONTRACT ADMINISTRATION DATA           | 59 - 62  | M   | EVALUATION FACTORS FOR AWARD   |  |                        |
| X H  | SPECIAL CONTRACT REQUIREMENTS          | 63   | CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE |  |  |                        |
| 17. [X] CONTRACTORS NEGOTIATED AGREEMENT<br>Contractor is responsible to sign this document and return to contracting officer. Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and (i) any continuation sheet for the consideration named herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. |  |  |   |  |  |                        |
| 18. [ ] CONTRACTORS NEGOTIATED AGREEMENT<br>Contractor is not required to sign this document. Your offer on Solicitation Number N40080-09-R-0161   |  |  |   |  |  |                        |
| Including the addition or changes made by you on which additions or changes are set forth in full above, is hereby accepted as to the terms listed above and on any continuation sheet. This award contract and the contract which contains the following documents: (a) the Government's solicitation and your offer, and (b) this award contract. No further contractual document is necessary.  |  |  |   |  |  |                        |
| 19A. NAME AND TITLE OF SIGNER (Type or print)  |  | 20A. NAME OF CONTRACTING OFFICER<br>NAME: H. WALTER / CONTRACT SPECIALIST<br>TEL.: (212) 425-8216 EMAIL: j.walter@navfacny.mil |   |  |  |                        |
| 19B. NAME OF CONTRACTOR<br>BY _____  |  | 19C. DATE SIGNED<br>BY                     |   | 20B. UNITED STATES OF AMERICA<br>(Signature of Contracting Officer)  |  |                        |
|  |  |  |   | 20C. DATE SIGNED<br>14-May-2009  |  |                        |

NSN 7540-01-152-0069

Previous edition is obsolete

28-107

GPO:2005 O - 600-794

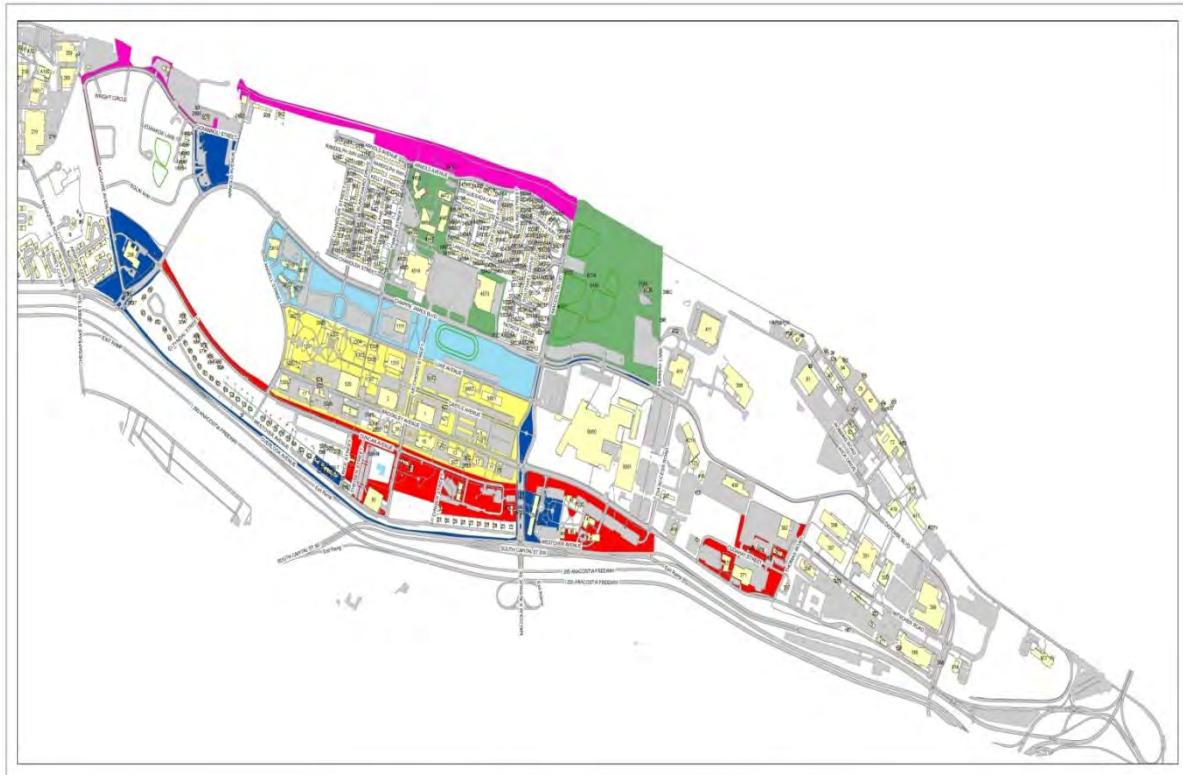
STANDARD FORM 28 (REV. 12/2002)

Prescribed by GSA

14 CFR 33.21 (a)

THIS PAGE INTENTIONALLY LEFT BLANK

## **APPENDIX E. JOINT BASE ANACOSTIA-BOLLING GROUND MAINTENANCE MAP**



THIS PAGE INTENTIONALLY LEFT BLANK

## APPENDIX F. SALARY TABLE FOR “WS” WAGEGRADE PERSONNEL

[OPM.gov Home](#) | [Subject Index](#) | [Important Links](#) | [Contact Us](#) | [Help](#)

[Go](#)

[Advanced Search](#)





**SALARY TABLE 2010-DCB**

INCORPORATING THE 1.50% GENERAL SCHEDULE INCREASE AND A LOCALITY PAYMENT OF 24.22%

FOR THE LOCALITY PAY AREA OF WASHINGTON-BALTIMORE-NORTHERN VIRGINIA, DC-MD-VA-WV-PA

(See <http://www.opm.gov/oca/10tables/locdef.asp> for definitions of locality pay areas.)

TOTAL INCREASE: 2.42%

EFFECTIVE JANUARY 2010

Annual Rates by Grade and Step

| Grade | Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6 | Step 7 | Step 8 | Step 9 | Step 10 |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| 1     | 22115  | 22854  | 23589  | 24321  | 25056  | 25489  | 26215  | 26948  | 26977  | 27863   |
| 2     | 24865  | 25456  | 26279  | 26977  | 27280  | 28082  | 28885  | 29687  | 30490  | 31292   |
| 3     | 27130  | 28034  | 28938  | 29843  | 30747  | 31651  | 32556  | 33460  | 34364  | 35269   |
| 4     | 30456  | 31471  | 32486  | 33501  | 34516  | 35531  | 36548  | 37560  | 38575  | 39590   |
| 5     | 34075  | 35210  | 36346  | 37481  | 38616  | 39752  | 40887  | 42022  | 43158  | 44293   |
| 6     | 37983  | 39249  | 40514  | 41780  | 43046  | 44312  | 45578  | 46843  | 48109  | 49375   |
| 7     | 42209  | 43616  | 45024  | 46431  | 47838  | 49246  | 50653  | 52061  | 53468  | 54875   |
| 8     | 46745  | 48303  | 49881  | 51418  | 52976  | 54534  | 56092  | 57649  | 59207  | 60765   |
| 9     | 51630  | 53350  | 55070  | 56791  | 58511  | 60232  | 61952  | 63673  | 65393  | 67114   |
| 10    | 56857  | 58752  | 60648  | 62544  | 64439  | 66335  | 68230  | 70126  | 72022  | 73917   |
| 11    | 62467  | 64548  | 66630  | 68712  | 71794  | 72876  | 74958  | 77040  | 79122  | 81204   |
| 12    | 74872  | 77368  | 79864  | 82359  | 84855  | 87350  | 89846  | 92341  | 94837  | 97333   |
| 13    | 89033  | 92001  | 94969  | 97936  | 100904 | 103872 | 106839 | 109807 | 112774 | 115742  |
| 14    | 105211 | 108717 | 112224 | 115731 | 119238 | 122744 | 126251 | 129758 | 133264 | 136771  |
| 15    | 123758 | 127883 | 132009 | 136134 | 140259 | 144385 | 148510 | 152635 | 156500 | 155500  |

- [Salaries and Wages](#)
- [Compensation Administration Home Page](#)

U.S. Office of Personnel Management 1900 E Street, NW, Washington, DC 20415 |  - (202) 606-1800  | TTY (202) 606-2532 

THIS PAGE INTENTIONALLY LEFT BLANK

**APPENDIX G. JOINT BASE ANACOSTIA-BOLLING GROUNDS  
MAINTENANCE CONTRACT FUNCTIONAL ASSESSMENT PLAN**

**FUNCTIONAL ASSESSMENT PLAN (FAP)**  
**Grounds Maintenance**  
**1503020 - Pest Control**

| <b>FACILITY INVESTMENT FAP</b>  |  |   |  |                  |     |             |      |
|---|--|---|--|------------------|-----|-------------|------|
| <u>Assessment Levels (AL)</u>   |  | <u>Assessment Frequency (Freq)</u>  | <u>Method of Assessment (MOA)</u>  |                  |     |             |      |
| AL1   | Start assessment at this Level   | A – Annually<br>Q – Quarterly<br>M – Once per month<br>BW – Once every 13-16 days<br>W – Once per week<br>R – As required | PS – Periodic Sampling<br>RS – Random Sampling<br>VCC – Validated Customer Complaints<br>UV – Unscheduled Visits<br>CE – Customer's Evaluation |                  |     |             |      |
| AL2   | Add this Level if Contractor performance for AL1 is Unsatisfactory       |   |  |                  |     |             |      |
| AL3   | Add this Level if Contractor performance at AL1 or AL2 is Unsatisfactory |   |  |                  |     |             |      |
| Note: Return to appropriate Assessment Level when performance improves. |  | Note: The first method listed in the MOA column below is the primary assessment method.                                   |  |                  |     |             |      |
| Spec Item   | Performance Objective  | Performance Standard  | MOA  | Assessment Level |     | Sample Size | Freq |
|   |  |   |  | AL1              | AL2 |             |      |

| Spec Item | Performance Objective   | Performance Standard  | MOA | Assessment Level |     |     | Sample Size |         | Freq |
|-----------|---|---|-----|------------------|-----|-----|-------------|---------|------|
|           |   |   |     | AL1              | AL2 | AL3 | Normal      | Reduced |      |
| 3.0       | The Contractor shall provide timely and effective scheduled and unscheduled pest control services   | Applicable performance standards provided in J-1503020-02 (Pest Group Sheets) are maintained.   |     |                  |     |     |             |         |      |
| 3.1       | The Contractor shall provide timely scheduled pest control services to prevent the appearance and infestation of pests                      | Applicable performance standards provided in J-1503020-02 (Pest Group Sheets) and CPLs are maintained for all sites.  |     |                  |     |     |             |         |      |
| 3.1.1     | The Contractor shall provide timely turf and ornamental pest control services to prevent the appearance and infestation of pests.           | Applicable performance standards provided in J-1503020-02 (Pest Group Sheets) are maintained.<br>Pest control services are provided per the approved work schedule. |     |                  |     |     |             |         |      |
| 3.1.2     | The Contractor shall provide timely scheduled weed control services to prevent the appearance of weeds.                                     | Applicable performance standards provided in J-1503020-02 (Pest Group Sheets) are maintained.<br>Pest control services are provided per the approved work schedule. |     |                  |     |     |             |         |      |
| 3.1.3     | The Contractor shall provide sustained bare ground vegetation control to preclude the appearance of vegetation around transformer stations, | Applicable performance standards provided in J-1503020-02, Pest Group Sheets, shall be  |     |                  |     |     |             |         |      |

| Spec Item | Performance Objective  | Performance Standard  | MOA | Assessment Level |     |     | Sample Size |         | Freq |
|-----------|--|---|-----|------------------|-----|-----|-------------|---------|------|
|           |  |   |     | AL1              | AL2 | AL3 | Normal      | Reduced |      |
|           | water towers, sewage pump stations, and other designated areas   | maintained  |     |                  |     |     |             |         |      |
| 4         | IDIQ work may be ordered utilizing DoD EMALL in accordance with Section H or on a task order in accordance with the PROCEDURES FOR ISSUING ORDERS clause in Section G. The order will specify the exact locations and types of work to be accomplished. The period of performance will be specified in each order. | Applicable performance standards provided in J-1503020-02, Pest Group Sheets, shall be maintained |     |                  |     |     |             |         |      |

## 1503050 – Grounds Maintenance

| Spec Item | Performance Objective   | Performance Standard   | MOA | Assessment Level |     |     | Sample Size |         | Freq |
|-----------|---|--|-----|------------------|-----|-----|-------------|---------|------|
|           |   |  |     | AL1              | AL2 | AL3 | Normal      | Reduced |      |
| 3.0       | The Contractor shall maintain improved grounds, semi-improved grounds, and unimproved grounds to ensure a sightly appearance. | Improved, semiimproved, and unimproved grounds are maintained in an attractive manner consistent with the specified performance standards. |     |                  |     |     |             |         |      |

|         |  |   |  |  |  |  |  |  |
|---------|--|---|--|--|--|--|--|--|
| 3.1     | The Contractor shall maintain improved grounds to ensure a sightly appearance  | Improved Grounds are maintained in an attractive manner consistent with the specified CPL. Fertilization shall be performed in accordance with approved submitted schedule  |  |  |  |  |  |  |
| 3.1.1   | The Contractor shall maintain lawns in a manner that promotes proper health, growth, rich natural green color, and neat uniform manicured appearance | Lawns are healthy and present a uniform and attractive appearance.  |  |  |  |  |  |  |
| 3.1.1.1 | The Contractor shall maintain lawns to achieve a uniform grass height.   | Grass is uniform in appearance and is maintained to the height specified in J-1503050-03  |  |  |  |  |  |  |
| 3.1.1.2 | The Contractor shall maintain an edged cut to achieve a neat appearance  | Edging is uniform in appearance and vegetation does not encroach on ground structures   |  |  |  |  |  |  |
| 3.1.2   | The Contractor shall operate water control devices and irrigation systems to provide the appropriate amount of water to lawns and other vegetation   | Irrigation provides proper health, growth, color, and appearance of grounds. Sprinkler heads and riser heads are operable, free of leaks, obstructions, or other defects that prevent proper operation. Repair of system defects are scheduled within 24 hours of defect identification, and completed within 24 hours after scheduling repair. |  |  |  |  |  |  |

|       |   |  |  |  |  |  |  |
|-------|---|--|--|--|--|--|--|
|       |   |  |  |  |  |  |  |
| 3.1.3 | The Contractor shall remove debris to achieve a clean and neat appearance.  | Areas are maintained clear of debris with an overall neat appearance   |  |  |  |  |  |
| 3.1.4 | The Contractor shall trim shrubs and hedges to maintain a healthy, uniform, well shaped appearance and to prevent interference with pedestrians, vehicular traffic, and building encroachment | Shrubs and hedges are healthy and present a neat and balanced appearance. Shrubs and hedges do not encroach on structures, pedestrian traffic, or vehicular traffic  |  |  |  |  |  |
| 3.1.5 | The Contractor shall maintain plants and beds to provide a neat appearance and promote plant health.  | Plants, beds, planter boxes, ground cover, sign beds, ponds, flower beds, and other specified sites are maintained as required, present a neat appearance, and contain healthy plants and no weeds. The Contractor's plant and bed schedule is approved by the KO and adhered to |  |  |  |  |  |
| 3.1.6 | The Contractor shall provide maintenance and care for designated trees to promote tree health and to prevent  | Trees present a healthy appearance. Trees do not encroach on structures, pedestrian traffic, or vehicular traffic  |  |  |  |  |  |

|        |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|
|        | interference with pedestrian and vehicular traffic, and structure encroachment.  |  |  |  |  |  |  |  |
| 3.1.7  | The Contractor shall remove obstructions and control vegetation in storm drainage systems to permit unrestricted flow of storm water runoff. | No evidence of obstructions in the visible area of the drainage systems.   |  |  |  |  |  |  |
| 3.1.8  | The Contractor shall aerate the grass to promote health and growth.  | Grass is aerated as necessary or specified.  |  |  |  |  |  |  |
| 3.1.9  | The Contractor shall maintain playground areas to ensure grounds are well maintained   | Playgrounds are maintained as required and are free of grass, weeds, leaves, stones, rocks, trash, and debris.   |  |  |  |  |  |  |
| 3.1.10 | The Contractor shall seed as specified to promote a healthy appearance.  | Grassy areas are maintained as required and have a healthy appearance.   |  |  |  |  |  |  |
| 3.1.11 | The Contractor shall take a proactive, responsible role in the management of green waste.  | Green wastes are removed as they are generated and reported accordingly. Green waste report submitted on time.   |  |  |  |  |  |  |
| 3.1.12 | The Contractor shall maintain grass, infields, warning tracks, and chalk lines on ball fields.   | Ball fields are maintained in an attractive manner. Grass heights do not exceed 2.5 inches during the playing season. Chalk lines are maintained according to standard baseball rules. |  |  |  |  |  |  |

|        |   |   |  |  |  |  |  |  |
|--------|---|---|--|--|--|--|--|--|
| 3.1.13 | The Contractor shall maintain inlet area to ensure a sightly appearance.  | Barge inlet area is maintained in an attractive manner.   |  |  |  |  |  |  |
| 3.2    | The Contractor shall mow and trim and control vegetation to maintain appropriate height.  | Vegetation is maintained as required. Debris is removed from grounds  |  |  |  |  |  |  |
| 3.2.1  | The Contractor shall mow and trim and control vegetation to maintain appropriate height.  | Vegetation is maintained as required. Debris is removed from grounds.   |  |  |  |  |  |  |
| 3.2.2  | The Contractor shall mow and trim and control vegetation to maintain appropriate height in designated areas of magazines, bunkers and berms.                  | Grass height is maintained as required.   |  |  |  |  |  |  |
| 3.2.3  | The Contractor shall control vegetation in fire lanes, areas adjacent to perimeter fences, and roadway clearances to provide for the area's intended purpose. | Fire lanes, areas adjacent to perimeter fences, and roadway clearances are maintained clear of vegetation per the Contractor schedule. Fire lanes and roadways are clear of obstructions that interfere with vehicular passage. |  |  |  |  |  |  |
| 3.3    | The Contractor shall not use products listed in this temporary quarantine   | Contractor adheres to the standards set by Virginia Department of Agriculture   |  |  |  |  |  |  |

|         |   |   |  |  |  |  |  |  |  |
|---------|---|---|--|--|--|--|--|--|--|
| 3.4     | The Contractor shall perform other recurring grounds maintenance services.  | Recurring services are completed in a timely manner and each is completed in accordance with its unique performance standard.                                 |  |  |  |  |  |  |  |
| 3.4.2   | The Contractor shall remove bird droppings from side walks, steps, and handicapped ramps  | Sidewalks, steps, and handicapped ramps are maintained free from bird droppings and have a neat and healthy appearance  |  |  |  |  |  |  |  |
| 3.4.2.1 | The Contractor shall remove trash and debris at the dump tipple area.   | Maintain the tipple area free of debris and trash in a neat and orderly appearance  |  |  |  |  |  |  |  |
| 3.5     | The Contractor shall support grounds protection operations in the event of anticipated weather events.  | Protective measures are installed prior to an anticipated event and removed after weather event has passed. Maintain safe and accessible access to facilities |  |  |  |  |  |  |  |
| 4.0     | IDIQ work may be ordered utilizing DoD EMALL in accordance with Section H or on a task order in accordance with the PROCEDURES FOR ISSUING ORDERS clause in Section G. The order will specify the exact locations and types of work to be accomplished. The period of performance will be | Performance standards for IDIQ work will be the same as those in Spec Item 3 where applicable or are specified in the ELIN description.                       |  |  |  |  |  |  |  |

MONTHLY PERFORMANCE ASSESSMENT SUMMARY

Location: JBAB

Month/Year: March 2011

| Spec Item | Title        | AL1 Rating |    |   |   |   | AL2/AL3 Rating |   |   | VOC |
|-----------|--------------|------------|----|---|---|---|----------------|---|---|-----|
|           |              | E          | VG | S | M | U | # Samples      | A | U |     |
| 3.1       | Pest Control |            |    | X |   |   | 2              |   |   |     |
|           |              |            |    |   |   |   |                |   |   |     |
|           |              |            |    |   |   |   |                |   |   |     |
|           |              |            |    |   |   |   |                |   |   |     |
|           |              |            |    |   |   |   |                |   |   |     |
|           |              |            |    |   |   |   |                |   |   |     |
|           |              |            |    |   |   |   |                |   |   |     |

MONTHLY PERFORMANCE ASSESSMENT SUMMARY

Annex/cub-annex: 1503020

Comments:

The contractor continues to consistently meet all performance objectives and standards of the contract.

Recommended Actions:

SPAR Signature: Carl Bacon Date: 1 April 2011

THIS PAGE INTENTIONALLY LEFT BLANK

## LIST OF REFERENCES

Government Accountability Office. (GAO). (2009, March). *Defense infrastructure: DoD needs to periodically review support standards and costs at joint bases and better inform Congress of facility sustainment funding uses* (GAO-09-336). Retrieved from <http://www.gao.gov/new.items/d09336.pdf>

Government Accountability Office (GAO). (2010, May 20). *Sourcing policy: Initial agency efforts to balance the government to contractor mix in the multisector workforce* (GAO-10-744T). Retrieved from <http://www.gao.gov/new.items/d10744t.pdf>

Imbens, G. M., & Wooldridge, J. M. (2008, August). *Recent developments in the econometrics of program evaluation*. Retrieved November 21, 2011, from The National Bureau of Economic Research: <http://www.nber.org/papers/w14251.pdf>

Keller, G. (2008). *Statistics for management and economics* (8th ed.). Mason, OH: South-Western Cengage Learning.

Mankiw, N. G. (2006). *Principles of economics* (4th ed.). Mason, OH: Thompson South-Western.

Stokey, E., & Zeckhauser, R. (1978). *A primer for policy analysis*. New York, NY: W. W. Norton.

Private battles: America's Army is relying ever more heavily on private military contractors. (2008, August 19). *The Economist*. Retrieved from <http://www.economist.com/node/11955577>

Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]). (2008, May 29). *Department of Defense instruction: DoD pest management program* (DoD Instruction 4150.07). Retrieved from <http://www.dtic.mil/whs/directives/corres/pdf/415007p.pdf>

U.S. Air Force. (2008, September). *Pest management plan: Bolling Air Force Base, D.C.* Washington, D.C.: Parsons.

U.S. Office of Personnel Management. (2010). *Salaries and wages*. Retrieved from <http://www.opm.gov/oca/10tables/html/dcb.asp>

THIS PAGE INTENTIONALLY LEFT BLANK

## ABOUT THE AUTHORS

**Michael C. Bishop**, Lieutenant Commander, U.S. Navy, student, Graduate School of Business and Public Policy – Acquisition Management. LCDR Bishop earned a B.S. in 1997 from Sam Houston State University, Huntsville, TX. LCDR Bishop is a Supply Corps Officer and has completed five operational and staff tours in his 13 years of service, including deploying to Iraq in support of Operation Enduring Freedom. Upon graduation from the Acquisition Program and receipt of his master's degree in business administration from the Naval Postgraduate School in December 2011, LCDR Bishop will report to Defense Contract Management Agency, Corpus Christi, TX.

**Shane H. Derby**, Lieutenant Commander, U.S. Navy, student, Graduate School of Business and Public Policy – Financial Management. LCDR Derby earned a B.S. in Business Administration in 1999 from Mount Senario College, Ladysmith, WI. LCDR Derby is a Supply Corps Officer, beginning his career in the enlisted ranks of the U.S. Navy and U.S. Army. He has completed five combat tours of duty in his 18 years of active duty. Upon graduation from the financial management program at the Naval Postgraduate School in December 2011, LCDR Derby will report to Space and Naval Warfare Systems Command, San Diego, CA.

THIS PAGE INTENTIONALLY LEFT BLANK

## **INITIAL DISTRIBUTION LIST**

1. Defense Technical Information Center  
Ft. Belvoir, Virginia
2. Dudley Knox Library  
Naval Postgraduate School  
Monterey, California
3. NAVFAC Washington  
Washington, DC